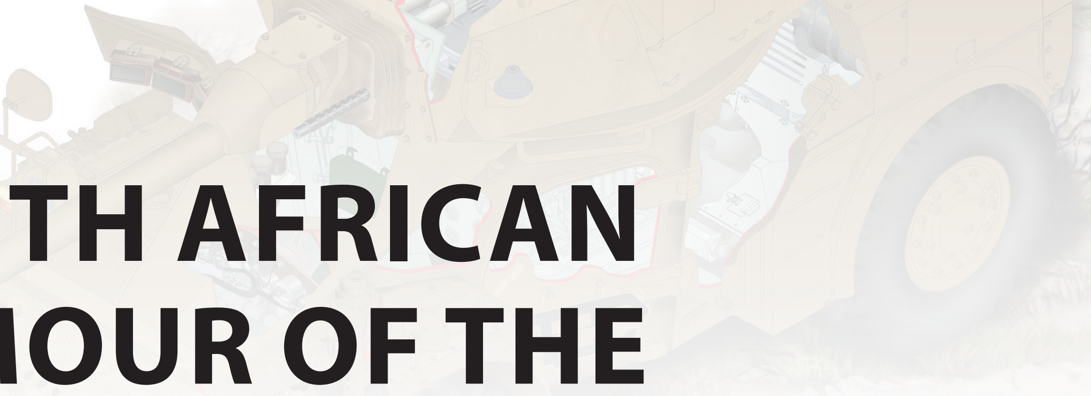

SOUTH AFRICAN ARMOUR OF THE BORDER WAR 1975–89

KYLE HARMSE & SIMON DUNSTAN

ILLUSTRATED BY
PIERRE LOWE VICTOR

Authors

Based in Johannesburg, Kyle Harmse has long been interested in armoured vehicle design and the proxy wars of the Cold War. He recently graduated *cum laude* with a History degree and is now busy with his Masters at the University of Johannesburg.

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Illustrator

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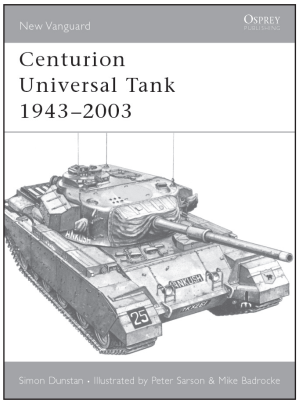
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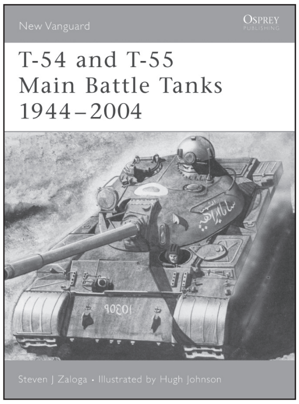
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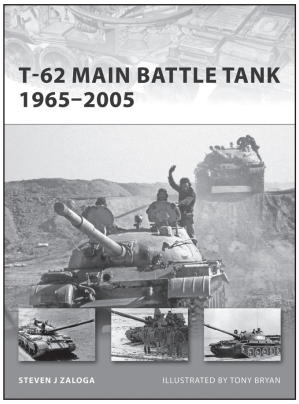
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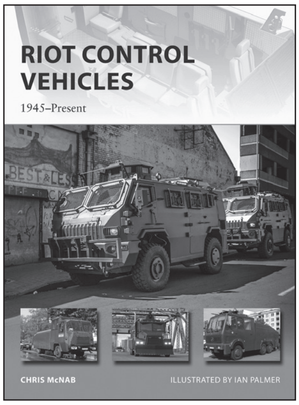
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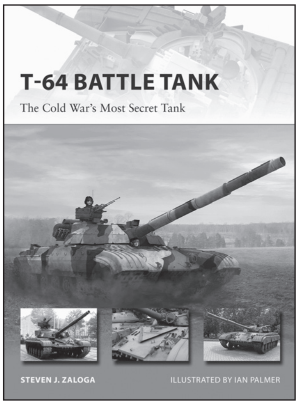
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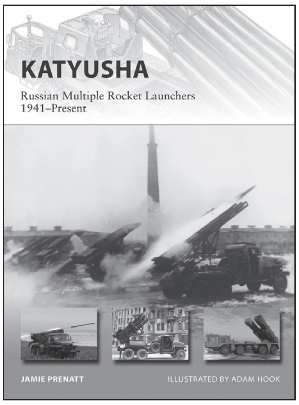
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This electronic edition published in 2017 by Bloomsbury Publishing Plc

First published in Great Britain in 2017 by Osprey Publishing,
PO Box 883, Oxford, OX1 9PL, UK
1385 Broadway, 5th Floor, New York, NY 10018, USA
E-mail: info@ospreypublishing.com

Osprey Publishing, part of Bloomsbury Publishing Plc

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A CIP catalogue record for this book is available from the British Library.

Print ISBN: 978 1 4728 1743 3
PDF e-book ISBN: 978 1 4728 1744 0
ePub e-book ISBN: 978 1 4728 1745 7

Index by Zoe Ross
Typeset in Sabon and Myriad Pro
Originated by PDQ Media, Bungay, UK

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Cover image: Olifant Mk 1

Authors' notes

This work primarily focuses on the technical development and use of armour in the Border War by the South African Defence Force, from 1975 to 1989. It is by no means a comprehensive chronology of that conflict, and should be read in conjunction with Osprey's *Modern African Wars (3): South-West Africa* (Men-at-Arms 242) by Helmoed-Römer Heitman, which covers the factions, military organizations and operations of the Border War in far greater detail than is possible here – particularly the counter-insurgency conflict. The phrase 'Namibia' when used below refers to the geographic confines of what is today the Republic of Namibia; whilst South West Africa refers to the political state (they are in most cases used interchangeably and practically refer to the same area in this historical context). For towns, cities and villages in Angola, their historical names will be used. Finally, South African operations in the Border War number in the several dozens, both 'internal' operations within Namibia and 'externals' fought in Angola. This work does not seek to diminish the historic impact of operations not mentioned, or the experiences of combatants involved, but rather is a brief study of the major armoured clashes of the war which pays particular emphasis to the role military doctrine played in technical development and vice versa, and the effects this had on the ground.

Photographs

All photographs are courtesy of the Armour Formation South African National Defence Force, Jim Hooper and Cornie van Schoor, to whom the authors express their gratitude.

Acknowledgements

The authors wish to express their gratitude to the Armour Formation SANDF, Pantserbond/Armour Association and the School of Armour, Bloemfontein, for their invaluable cooperation and to the following individuals for their important contributions:

Ewald Beneke, Paul Bester, Stephanus Buys, Marco Caforio, Shaun Carroll, John French, Bradley Futter, Chris Gildenhuys, Wim Grobler, Callie Harmse, Alwyn Hattingh, Helmoed-Römer Heitman, Raymond Hohls, Jim Hooper, Heinrich Janzen, Danie Malan, David Mannall, William Marshall, André Retief, Tony Savides, Jean Pierre Scherman, Cornie van Schoor, H.W. Short, William Surmon, Blackie Swart, Andre Venter, Pierre Lowe Victor, Jacques de Wet.

Dedication

To my parents and brother.

- Kyle Harmse

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SOUTH AFRICAN ARMOUR OF THE BORDER WAR 1975–89

INTRODUCTION

The conflict known to South Africans as the Border War (1966–89) was fought primarily in the northern stretches of Namibia and the southern areas of Angola. Initially, the war was one of counter-insurgency fought between PLAN (People's Liberation Army of Namibia), the armed wing of the South West Africa People's Organization (SWAPO), and the Republic of South Africa, which had administered Namibia (then known as South West Africa, or SWA) as a de facto province under a League of Nations mandate since 1917. The war would soon escalate far beyond the counter-insurgency conflict within South West Africa, when in April 1974 a bloodless coup swept the authoritarian Estado Nuevo regime from power in Portugal and replaced it with a left-wing government. The Carnation Revolution, as it was known, would have devastating consequences for Portugal's former African colonies where Portuguese security forces had largely been successful in suppressing decolonization.

The sudden departure of the Portuguese resulted in a power vacuum, especially in Angola, SWA's immediate northern neighbour. Here chaos erupted as three liberation movements – the MPLA, UNITA and the FNLA – promptly began fighting each other for territory and prestige prior to complete Portuguese evacuation and a handover of power in late 1975. The Soviet-backed MPLA began to gain the upper hand in the conflict, and the West was faced with the prospect of a Soviet-aligned state not only astride the Atlantic sea routes, but within striking distance of the Cape of Good Hope. SWAPO took full advantage of the chaos in Angola to slip across the border, and the spectre of a much-enhanced insurgency in northern SWA no doubt played a role in the South African decision which followed. Encouraged by covert American assistance from the CIA, which leveraged Zambian and Zairean support, the South African government opted to intervene in the Angolan Civil War on the side of Jonas Savimbi's UNITA and Holden Roberto's

In the early 1950s, the SADF procured 203 Centurion tanks together with Saracen armoured personnel carriers (APCs) and Ferret armoured cars from Great Britain in the expectation of fighting a conventional war in the Middle East, as part of a Commonwealth division. When South Africa became a republic in 1961, the country's defence strategy changed radically with the emphasis now on internal security and the protection of the borders against revolutionary insurgents. Here, a Centurion Mk 5 undergoes training in the hot, arid terrain that taxed its Meteor engine to the full. Nevertheless, the Centurion was subsequently extensively modified and upgraded to become the Olifant (Afrikaans for 'elephant') which was employed to great effect during the latter stages of the Angolan War.

FNLA. The unlikely alliance of convenience between the then-Maoist UNITA and the South Africans had been underwritten by a promise of UNITA support in South African operations against SWAPO. In return, the South Africans undertook to gain the anti-MPLA alliance as much ground as possible before the 11 November Independence Day deadline. The arrival of South African special forces troops and specialist trainers, which included men of the Armoured Corps, heralded the beginning of Operation *Savannah*, one of the most spectacular conventional campaigns ever fought in Africa.

The original counter-insurgency campaign in SWA was conducted exclusively by the South African Police using standard police vehicles, mainly Land Rovers, until the threat of landmines required the use of mine-protected vehicles such as the Casspir. By 1974 it was necessary also to deploy the South African army with its Armoured Fighting Vehicles (AFVs) to counter the increasingly well-equipped SWAPO insurgents. With a load of 56 mortar bombs, the Panhard 60 was able to provide both direct and indirect fire with commendable accuracy given the proficiency of the crew. This AML-60 is conducting a raid against a SWAPO base at Xangongo in Cunene Province during the 1981 Operation *Protea*, one of many cross-border operations into Angola.

THE ELAND ARMOURED CAR

The South African Defence Force (SADF) which went to war in Angola in 1975 had been undergoing a period of significant change ever since the departure of South Africa from the British Commonwealth in 1961. As a result of ever-worsening ties with the United Kingdom, South Africa had withdrawn its commitment to a Commonwealth armoured division designed to have served as a reaction force for the Middle East. Equipment for this division – some 203 Centurion tanks, 280 Saracen armoured personnel carriers (APCs) and 280 Ferret scout vehicles – had already been purchased and delivered by 1956. Following their withdrawal from the Commonwealth, the SADF undertook a study which concluded that its future operations were likely to be expeditionary operations in nearby African states' campaigns which bore distinct similarities to French operations in North Africa. What followed was a period of close co-operation between the SADF and French arms manufacturers, who benefited greatly from the South African/British split. The South African Air Force purchased Mirage IIIs and Mirage F1s, whilst the South African Navy purchased several submarines and attack craft.

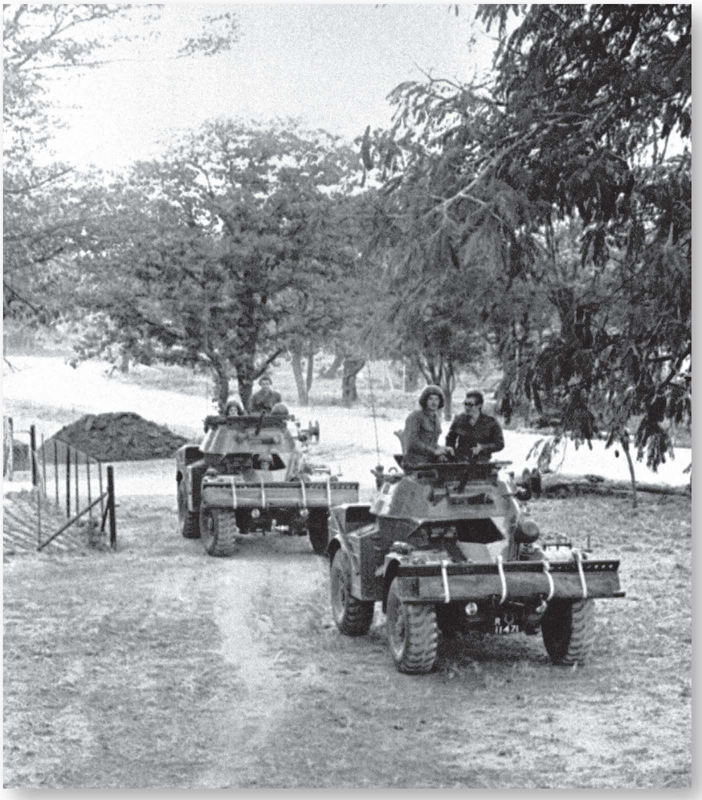
The army, in the meanwhile, was searching for a lightweight, long-ranged armoured reconnaissance vehicle which would be ideal for mounted operations in Africa. These vehicles, which would equip the armoured reconnaissance

Once South Africa became a republic it wished to diversify its arms procurement policy beyond Great Britain. France became a provider of Dassault Mirage aircraft, Daphne-class submarines and armoured cars, including the AML Panhard series. It fitted South African requirements extremely well. The standard model was the Panhard 60, as here, mounting a breech-loading mortar and a co-axial 7.62mm machine gun in a two-man turret. Designed as a light patrol vehicle, it was used for a host of roles in South African service.

squadrons of the South African army, were to be heavily armed so that they could effectively fight in their own right, whether on scouting operations or as part of a highly mobile and aggressive striking force. The British Saladin armoured car was considered and rejected, as was the Panhard EBR. Another vehicle from Panhard, the AML, had shown promise but it was considered under-gunned with its main armament of a 60mm breech-loading mortar. Panhard duly noted the South African concerns and mounted a DEFA 90mm low-pressure gun in a new turret, creating the AML-90. The AML-60 and AML-90 started production in 1961 and entered pilot South African service in 1962 as the Eland Mk 1. By 1964, Panhard had approved licensed production and the industrial firm of Sandock-Austral began building the armoured car designated by the SADF as the Eland Mk 2.

The base Eland vehicle consisted of a welded steel hull, which was proof against rifle fire and low- to medium-energy artillery fragments but vulnerable to any calibre over 12.7mm. The vehicle had an exceptionally low profile, and was a small target, being only 2.5m tall and 2m wide. The original Panhard 1.99-litre engine developed a mere 90hp, which nevertheless could propel the 6-tonne vehicle across flat terrain at higher speeds than the Centurion tank. Its four-wheel-drive provided adequate cross-country performance, though in extreme terrain the Eland could and did bog down due to inadequate ground clearance. The Eland-60 retained the turret from the original AML, whose 60mm mortar could fire a 1.72kg bomb at 200m/s out to a range of 2,000m in the direct fire role. Though potent enough against infantry, the mortar's bombs were ineffective against armour. In the support role 60mm armament was mostly retained, where its illumination round was particularly appreciated.

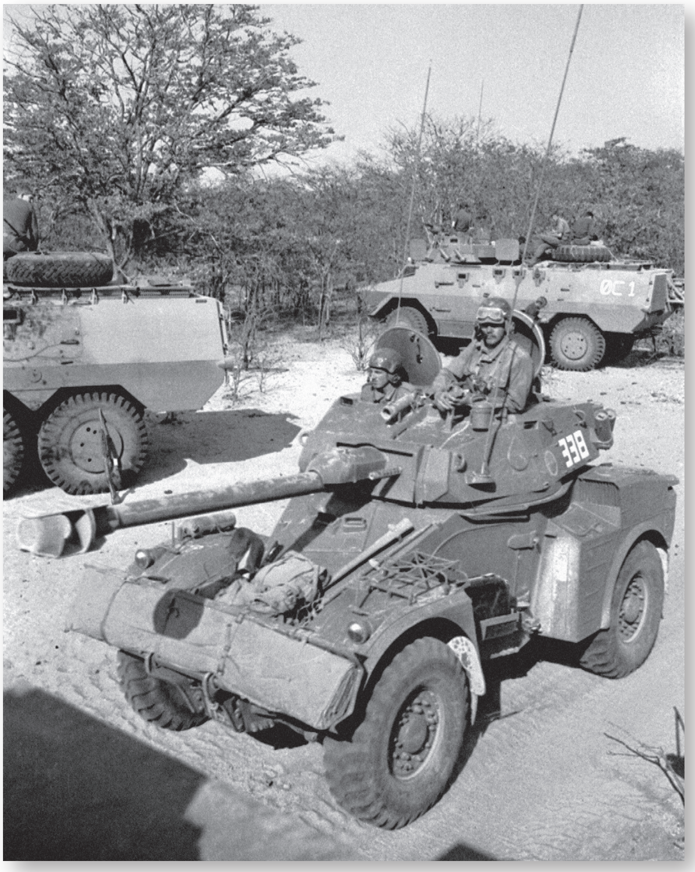
A pair of Eland-60s conduct a patrol in the eastern Caprivi Strip which, due to its geography, was much prone to infiltration by SWAPO. Designed as a light patrol vehicle, the Eland was used extensively for reconnaissance purposes; convoy escort; route clearance and increasingly as an AFV in its own right. Small, compact and fast, the Eland was not the most comfortable vehicle to crew but it proved its effectiveness repeatedly throughout the campaign. By aggressive tactics, crews were able to dominate many contacts through their combination of mobility and concentrated firepower against an often less flexible enemy.



The Eland-90, in contrast, was very well armed for a vehicle of its size. Its welded turret featured a distinct commander's cupola, and was considerably enlarged to accommodate a GIAT 90mm F1 gun. Designated the GT-2 in South African service, the gun was much lauded by its users. Despite the low pressure and muzzle velocity for a weapon of its calibre, the gun was accurate out to an effective range of some 2,200m for the high-explosive (HE) round and 1,200m for the high-explosive anti-tank (HEAT). The latter round was capable of penetrating some 320mm of steel plate, giving the diminutive vehicle an anti-tank punch entirely disproportionate to its small size. The HEAT round was more than adequate for dealing with T-34/85s encountered in Angola, although the appearance of the T-55 later heralded a tougher target which required careful shot placement to deal with, especially at the oblique angles of short-ranged bush warfare which tended to amplify the protective effect of sloped armour and minimize behind-armour blast and debris. T-54/T-55s usually required several hits from HEAT rounds to destroy them. The 90mm HE round, weighing 5.27kg, was extremely effective at demolishing light vehicles and log and soil bunkers, while towards the end of the Border War a very effective canister round had also been developed.

Gun-laying was accomplished by hand-cranking, whilst the gunner acquired and engaged targets via a telescopic sight co-sighted with the gun. A lack of turret drive made the gun impossible to stabilize, which meant that the Eland could not fire accurately on the move. This was not a problem for well-trained South Africans crews, however, who were effectively drilled in performing short-halt 'shoot and scoot' firing manoeuvres. More problematic was the shortage of ammunition storage space within the tiny Eland, which could hold only 29 rounds (20 rounds in the turret plus nine in the hull).

South African modifications to the AML began nearly immediately with the start of the vehicle's local production in 1964. The steering system was improved, as were the brakes. A new fuel system was introduced with the Mk 3 Eland, whilst the Mk 4 replaced the wildly unpopular electric clutch of the original with a conventional hydraulic system. Firing actuation was moved from the gunner's foot pedals to his hand cranks. The Mk 5 was a significant automotive upgrade which replaced the original Panhard engine with a 2.5-litre General Motors inline four-cylinder. Mounted on a rail, this 'power-pack' was designed to be rapidly removable in the field and considerably simplified maintenance, while its extra power enabled the Eland to reach 100km/h on paved roads. The Mk 5 also sported new communications equipment as well as South African-manufactured springs, shock absorbers, wheels and run-flat Dunlop tyres. Some 365 Mk 5s were built, starting in 1972, and by this stage improved South African-manufactured parts had effectively replaced all but the base hull and turret shell; fortuitous timing, given the implementation of total international arms sanctions in 1977 under the auspices of the UN Security Council Resolution 418. Some 1,016 older vehicles were converted to Mk 6 Elands (rebuilds of previous Marks to Mark 5 standard) starting in 1975, whilst the final Mark 7 Eland was put into production in 1979, incorporating a new commander's cupola which was based on that of the Ratel Infantry Fighting Vehicle (IFV). Several squadrons of Elands had been deployed to Namibia as part of the SADF's anti-insurgency campaign against SWAPO, and some of these would soon see service in Angola.



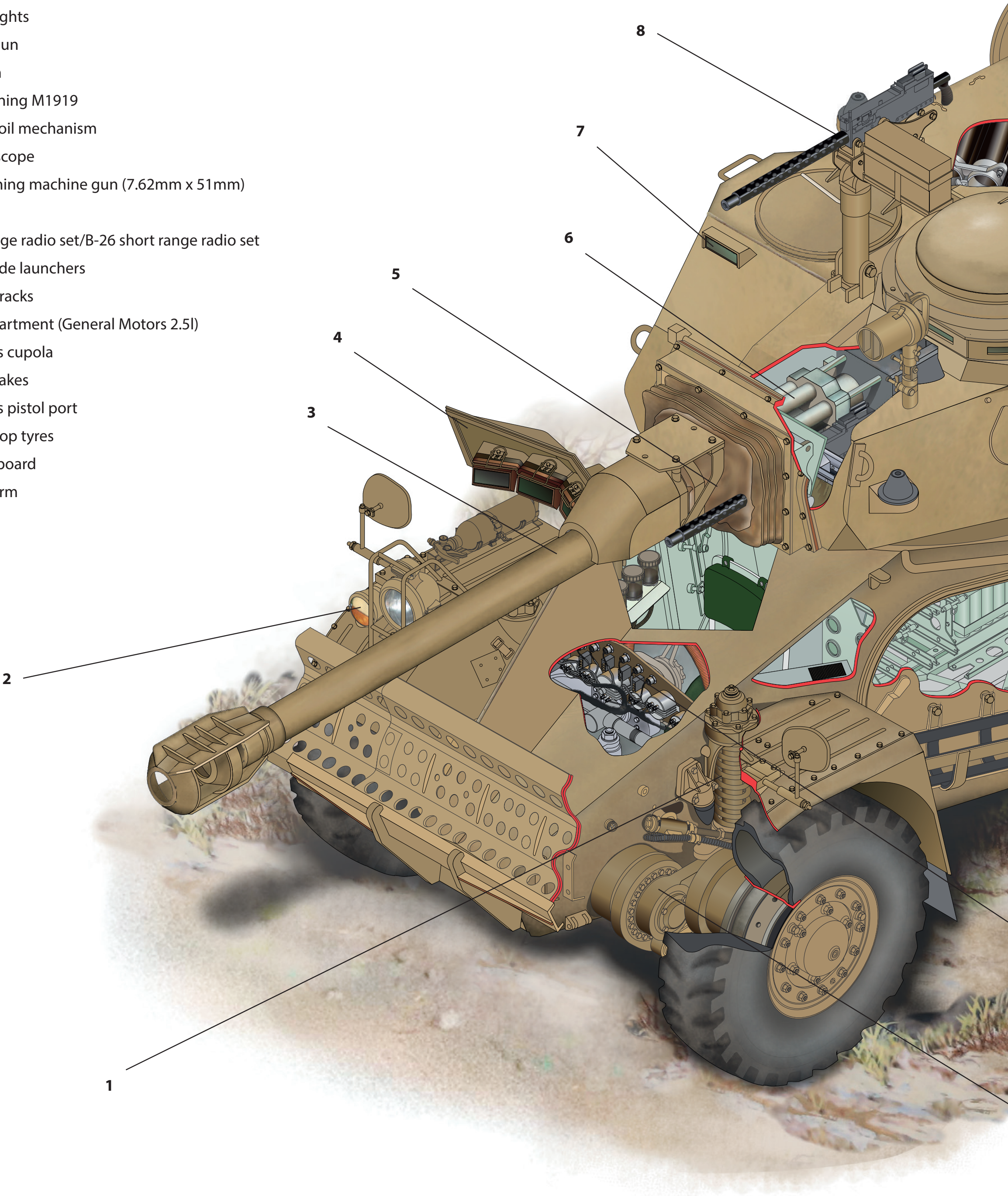
Although the AML-60 proved successful, there was an urgent requirement for greater firepower in the fire support role as the South African artillery was still equipped with British World War II-era guns including the 25-pdr and the 5.5in howitzer which were slow to respond in the fluid, rapid movement that typified counter-insurgency operations. Panhard was quick to respond with the AML-90, armed with a 90mm low-recoil gun in a two-man turret. Once licensed production of the Panhard series began from 1964 in South Africa by Sandock-Austral, the basic vehicle was enlarged to accommodate long-limbed South Africans with their generally larger-than-average feet and became the 'Eland': named after the indigenous antelope. The Eland-90 was undoubtedly one of the decisive AFVs of the Angolan War.

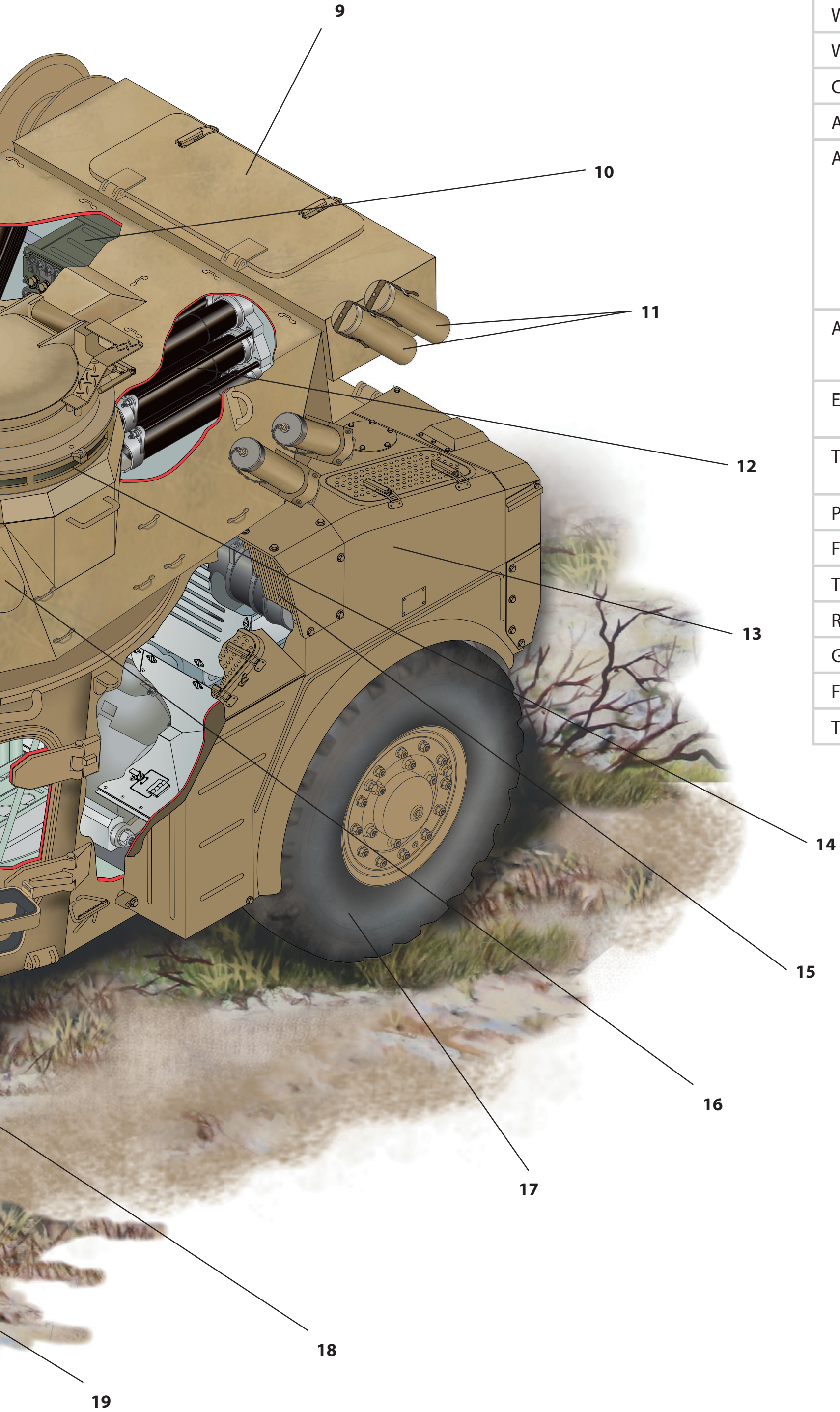
A

ELAND-90 MK 7 4x4 ARMOURED CAR, 1979

KEY

1. Suspension spring
2. Xenon headlights
3. GT-2 90mm gun
4. Driver's hatch
5. Coaxial Browning M1919
6. Hydraulic recoil mechanism
7. Gunner's episcope
8. M1919 Browning machine gun (7.62mm x 51mm)
9. Storage bins
10. B-56 long range radio set/B-26 short range radio set
11. Smoke grenade launchers
12. Ammunition racks
13. Engine compartment (General Motors 2.5l)
14. Commander's cupola
15. Engine air intakes
16. Commander's pistol port
17. Run-flat Dunlop tyres
18. Driver's dashboard
19. Suspension arm





Specifications	
Producer	Panhard/Sandock-Austral
Length	4.04m (5.12m with gun forward)
Width	2.015m
Height	2.5m
Wheelbase	2.5m
Weight	6 tonnes
Crew	3 – commander, gunner, driver
Armour	8–12mm
Armament	1 x 90mm Denel GT-2 low-recoil gun with -8º depression and +15º elevation
	2 x Browning MG4 machine guns
	4 x 81mm smoke grenade launchers
Ammunition	29 x 90mm rounds HE and HEAT
	6200 x 7.62mm rounds
Engine	4-cylinder in-line 2.5-litre 103hp diesel engine General motors
Transmission	Manual 6-speed with 6 forward and 1 reverse
Power to Weight	17.16hp/t
Fuel	142 litres
Top speed	90km/h
Range	240km off-road or 450km road
Gradient	23º
Fording	1.1m
Total Production	1,300

Shade was a much-sought commodity in the unrelenting heat and sun of the combat zone, with temperatures often rising to 50ºC. Equally important was the slit trench immediately beside any vehicle halted for any period of time. Not only was it cooler but it gave essential protection against air attack. For much of the war, the Angolan and Cuban pilots enjoyed air superiority in their MiG-21s and MiG-23s, although thankfully the accuracy of their bombing was usually inadequate. Here, these two Eland-90s are supporting a Ratel formation with its vehicles dispersed under the trees.

OPERATION *SAVANNAH*, 1975

Training

The year 1975 opened in Angola with UNITA and the FNLA being increasingly put on the defensive by the MPLA, with UNITA being driven away from the coast and into enclaves in the south and centre of the country, and the FNLA being split into two de facto independent factions – Holden Roberto's main faction in the north and Daniel Chipenda's in the south. The SADF had been approached for assistance by both UNITA and the FNLA as early as March, as the rule of law in Angola steadily disintegrated and refugees streamed out of the country. With the support of the CIA and Angola's immediate African neighbours, the South Africans began flying in the first of their 'mercenaries' – SADF personnel who had been ordered to take on the appearance of soldiers for hire. The Chipenda FNLA faction was one of the first to receive assistance and training, rapidly falling under the de facto leadership of Commandant Jan Breytenbach, a special forces pioneer who was already highly decorated. Jonas Savimbi quickly appealed for a training and support team like the one Chipenda received, and a group of SADF instructors from Infantry School, paratroop instructors, and the crews from an armoured car troop from 1 Special Service Battalion arrived soon after. Training each group was a serious challenge, either because of the extreme rawness of the recruits the SADF was working with, or the complete lack of UNITA and FNLA experience with conventional warfighting.

On the border with SWA, skirmishes were already erupting between SADF troops and fighters on the opposite side of the border. On 21 August 1975, the SADF armoured car squadron based on Ondangwa had taken action against a UNITA/MPLA fight which had threatened to spill over the border, with Eland-60s firing their mortars in support of a paratrooper incursion which killed six Angolan fighters.

First battles for the SADF

The next day, the SADF launched the first cross-border raid in pursuit of SWAPO fighters, who had increasingly taken advantage of the chaos in the region to slip into Angola. These raids at first consisted of various battle groups of paratroopers, Bushmen trackers, and the elite special forces of the Reconnaissance Commando, but on 25 August the SADF launched a major counter-insurgency operation which included 2 South African Infantry Battalion and its attached armoured car squadron. It was an inauspicious start to the first of several of these raids, and whilst it penetrated up to Pereira de Eca, the operation was not a major success. Its net effect was to encourage a far more concerted MPLA effort to the north, where the central UNITA base at Novoa Lisboa was now being advanced on by a major MPLA armoured column.

In order to spoil this attack, the South Africans led a UNITA column of their own in a counter-attack. The column was typical for the sort of bush warfare which dominated the Angolan and Rhodesian conflicts in the 1970s. Led by two Zairean-provided AML-90s and a single AML-60, it featured two 'technicals' armed with twin Browning M2 .50-calibre machine guns and a 14.5mm anti-aircraft gun respectively. Three jeeps carrying ENTAC missile launchers were manned by SADF Infantry School instructors, whilst two commandeered trucks rounded out the convoy as logistics vehicles. The entire column was accompanied by several hundred UNITA recruits and a more experienced battalion of UNITA soldiers who brought with them a 106mm recoilless gun. SADF troops had stripped and rebuilt the AMLs in order to get them running again, and had trained UNITA crews for their use, but when the order to attack had gone out had found themselves needing to man the Panhards instead.

The ad hoc force advanced to engage the MPLA column, which included T-34s and BTR APCs, and instead found itself caught in an ambush by their target. Attacked with mortars, machine guns and single-tube 122mm rocket launchers, the UNITA/SADF force fell back, with its heavy weapons laying covering fire for the withdrawal. The ENTAC crews, despite being exposed on their jeeps, returned fire and the AMLs bravely waded into action, their covering fire expending nearly their entire stock of ammunition. This allowed the UNITA and SADF force to safely disengage from Norton de Matos, and bought the trainers at Novoa Lisboa significant time. The MPLA attack on Novoa Lisboa fizzled out and was ultimately outflanked by Foxbat.

Increasingly, the battle had persuaded SADF command and the politicians in Pretoria that a more active South African role was needed if the MPLA was to be defeated before the 11 November deadline for Angolan independence, and it was decided to attach a full armoured car squadron (22 Elands with three men per Eland, and a support element), to each of the newly forming Task Forces. Breytenbach's FNLA troops and a battalion of Caprivean Bushmen was designated Task Force Zulu, and received the armoured car squadron of 2 South African Infantry Battalion, whilst the UNITA troops of Task Force Foxbat under Commandant Eddie Web was reinforced by a full squadron from the Special Service Battalion.

South African troops were becoming more fully embroiled in the conflict with each day, under the political condition that no South African infantryman be placed in harm's way and that most of the fighting be done from within the safety of armour. The thin skin of the Eland was a fact which had eluded those in Pretoria.

Zulu and Foxbat

Despite their rough start and the incomplete training of their Angolan components, both Task Forces soon earned a fierce reputation, with Zulu going on the offensive and Foxbat initially concentrating on the defence of Novoa Lisboa. Zulu sliced through what was at first light MPLA resistance,

OPPOSITE
An intelligence officer examines a destroyed and abandoned T-34/-85. This venerable World War II veteran equipped the Angolan factions initially but, when they fell as easy prey to the Eland-90s, they were replaced by the far more capable T-54/-55 series. The US Department of Defense stated that between 1972 and 1981 the Soviet Union shipped 1,855 tanks and self-propelled guns and a further 2,618 APCs to sub-Saharan Africa to foment the various revolutionary wars in the region.

There is no doubt that the T-54/-55 series proved a formidable opponent during the Border War but they were always compromised by the quality of their crews. However, once the Cubans deployed to Angola in large numbers their handling in the field became more aggressive and therefore more effective, but again they were constrained by inappropriate Soviet tactics that the more flexible South African tankers were able to trump in virtually every encounter. Accordingly, the Angolan losses were totally disproportionate. All those captured by the South Africans were passed to UNITA to form their own tank force, including this T-54B fitted with a KMT-4 mine plough.

taking the towns of Pereira d'Eca, Rocadas, Joao De Almeida and Sa Bandeira between 19 and 24 October. The battle for Mocamedes, taken on the 28th, was tougher, with Zulu on the receiving end of accurate 122mm rocket fire.

Foxbat, in the meantime, had launched a pointed counter-attack, and when Zulu wheeled inland on 31 October to support Foxbat's offensive, both Task Forces encountered substantial enemy formations who were determined to fight the South Africans and their Angolan allies. Zulu, having taken the town of Catengue, ran into a substantial FAPLA (the MPLA's armed wing, later to become the Angolan army) force well dug in and concealed on a ridge outside the town. FAPLA troops and their Cuban trainers laid down a very thick curtain of machine gun fire, whilst two recoilless 82mm B-10 guns and two 75mm artillery pieces, accompanied by RPG gunners, covered the road. Dug in behind the ridge were between 15 and 20 mortars, and a number of 122mm rocket launchers which laid down a fearsome bombardment on Zulu. Zulu, to their credit, launched a fierce counter-attack, using their own 81mm and World War II-vintage 3in mortars to counter-bombard the reverse slope of the ridge. The Eland squadron went into action, moving from cover to firing positions, firing after a 'short-stop' and returning to cover using the Eland's excellent mobility to their advantage. Between Zulu's mortars, 90mm Eland gunfire, and Vickers heavy machine guns, the FAPLA position was steadily reduced and broke under a close-in assault.

Foxbat, meanwhile, had captured Norton de Matos and was now fighting its way through an ambush outside Caluita. Attacked on an open river-bed, Foxbat's Elands had been used to flank the ambush position and forced their way into enfilading high ground which gave the squadron a commanding view of the enemy positions a mere 250m away. Pummelled by 90mm HE rounds and 7.62mm coaxial machine guns, the ambushers' positions were silenced one by one and they suffered between 63 and 80 dead.

These two engagements, and the first battle of Norton de Matos, set the tone for the rest of the offensive, with the Eland providing a mobile platform of heavy firepower which could flank FAPLA positions. Unable to respond on open ground, FAPLA commanders either withdrew or made a stand at entrenched positions, where the Eland could provide intense suppressive firepower with either its machine guns or a 90mm HE round which preceded an infantry assault. As at Norton de Matos, hostile armour was usually encountered piecemeal and poor FAPLA training meant that South African crews usually had a vast situational awareness advantage. Whilst either the T-34 or the PT-76 could effortlessly have demolished the Eland with a single hit, superior training, tactical use and gunnery allowed the wheeled Elands to overcome FAPLA's tanks quite easily. Task Force Zulu returned its attentions to the Angolan coast and captured Benguela's outskirts on 4 November, seizing the town itself on the 5th. Task Force Foxbat moved in concert with this attack to block enemy escapees, and then seized Cela

and Santa Comba on 11 November – the day of official Angolan independence.

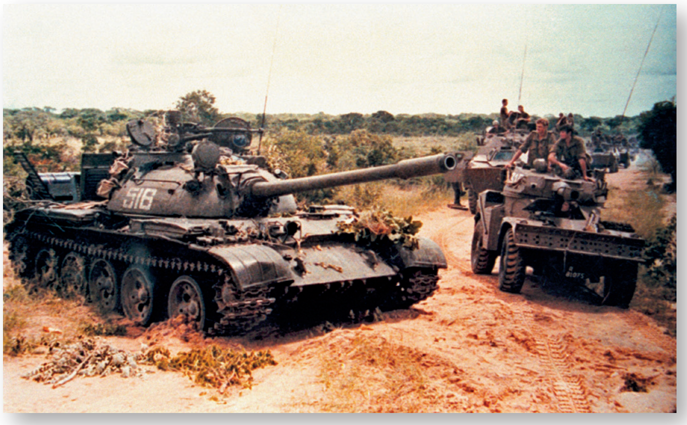
The situation was by now rapidly unravelling, despite the lightning advances of the South Africans and their Angolan allies. The FNLA under Holden Roberto had launched an ill-fated offensive towards Luanda from the north, which had been ground to dust in the battle of Quifangondo by FAPLA and a vastly expanded Cuban intervention. As Cuba's Operation *Carlota* swung into action, vast stores of Soviet arms began pouring into the country, including BM-21 multiple rocket launchers and stocks of T-34/85 and T-54/55 tanks. Cuban and FAPLA troops increasingly blew up bridges to block Zulu's coastal advance, which reached its high-water mark at Novo Redondo on 13 November.

Foxbat, meanwhile, had advanced through Ebo and on 23 November was moving through difficult terrain and plantations north of Ebo to the River Nhia. The ambush sprung by waiting FAPLA and Cuban troops in the close terrain was devastating. The Elands leading the advance were engaged first, encountering a hail of RPG and recoilless rifle fire which knocked out five armoured cars. The UNITA troops in the column were then savaged by artillery fire, and Foxbat was forced to pull back when its 25-pdr G1 guns proved unable to counter-bombard FAPLA effectively. The surviving crews of the wrecked Elands were forced to exfiltrate back to friendly territory that night.

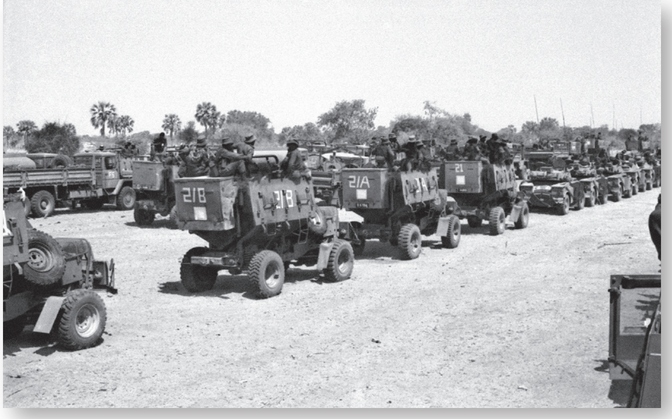
Battle of Bridge 14

Foxbat regrouped, determined not to be defeated, and Zulu again wheeled in from the coast to assist. The battle group attacked again, this time attempting to cross the Nhia at the inconspicuously named Bridge 14. Heavily covered by mortars, 76.2mm divisional guns, BM-21s and even AT-3 Sagger anti-tank guided missiles (ATGM), the South Africans avoided the mistakes of Ebo and effectively utilized their mortars and artillery, which now included 5.5in G2 guns. A force of 12 Elands skirted the anti-armour kill zone near the bridge and, though there were numerous close calls, none of the tiny Elands were hit as they first forced the crossing and then proceeded to shoot up their opponents at close range. UNITA infantry followed and the joint Cuban/FAPLA position was put to rout over the next three days (from 9 to 12 December). Ten 76.2mm guns, 22 120mm mortars and five BM-21s were captured, but the victory was for naught.

Even with the addition of two new Task Forces (Orange and X-Ray), Cuba and the Soviet Union were pouring ever-greater resources into Angola, with Cuba in particular landing entire



The appearance of the T-54/-55 on the battlefield was a significant escalation and taxed the Eland-90 crews to the full. It was only through superior training and fortitude that they were able to engage and destroy such powerful tanks with their low-recoil 90mm guns firing HEAT ammunition with an effective range of 1,200m. Taken during Operation *Askari*, which ended in January 1984, this photograph of David passing Goliath at the head of a column of 32 Battalion vehicles gives a vivid impression of the task; the Eland-90 had such a diminutive size compared with the knocked-out T-54, quite apart from their comparative armour protection.



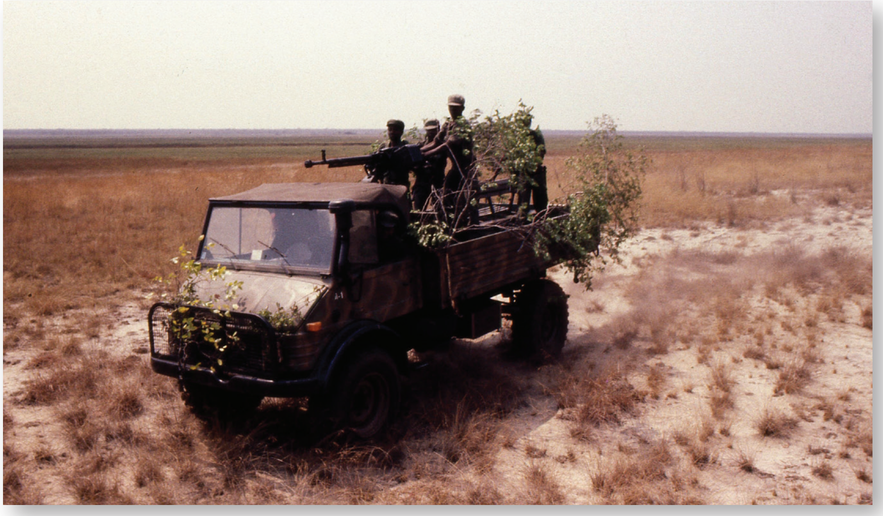
motorized battalions. The CIA's enthusiasm for the operation dried up as it became clearer internationally that the pariah South African state was the major force behind UNITA's successes, and the split Organization for African Unity was increasingly uniting behind an anti-South African position. Becoming more isolated and faced with the prospect of escalating conventional warfare against FAPLA and their Cuban backers, Pretoria gave up on its quest to win the Angolan Civil War for UNITA, and began withdrawing their units soon after the battle of Bridge 14. UNITA's position had been considerably strengthened by the South African intervention, but 1975 was a fatal year for the FNLA. Task Force Zulu's FNLA contingent found themselves abandoned by Chipenda, and turned their loyalties to Breytenbach and the SADF. In time, Task Force Zulu would be reborn as the SADF's elite 32 Battalion – 'The Buffalo Soldiers'.

As the war progressed the South Africans refined the concept of mobile strike forces for cross-border operations into Angola to attack insurgent camps, wreak as much damage as possible and then retire before concerted retaliation could be brought to bear. These varied depending on the nature of the target but were commonly structured around the formidable black troops of 32 Battalion, the Buffalo Soldiers, and those of 61 Mechanized Battalion. Here, a column of Buffels and Elands prepare to move off on another raid into Angola.

COUNTER-INSURGENCY IN SOUTH WEST AFRICA

As Operation *Savannah* was winding down and the SADF absorbed the lessons of the conflict within Angola, fighting continued in the counter-insurgency campaign within South African-administered SWA. With landmines being SWAPO insurgents' primary weapon, and causing the majority of both civilian and military casualties, new vehicles had already begun to enter service in this theatre to counter them.

The primary SWAPO strategy involved the infiltration of groups of insurgents into northern SWA, where each insurgent would lay either one or two heavy anti-tank mines or a number of smaller anti-personnel mines on roads, before exfiltrating back across the border into Angola. The SADF response had a number of aspects, notably aggressive patrolling of likely infiltration routes by units led by skilled Bushmen trackers. Upon the discovery of *spoor* (tracks) and other bush-signs in a given sector, hunter-killer groups termed Romeo-Mike teams were vectored in to run down and eventually engage insurgent teams with overwhelming firepower. Although the use of helicopters to supplement these Romeo-Mike teams was widespread (particularly cannon- and machine-gun-armed Allouette IIIs), the Romeo-Mike team itself remained largely motorized, as did the majority of SADF units responsible for sector patrols. These SADF units, and the South African Police units which supplemented them, remained extremely vulnerable to mine strikes themselves.



Before the widespread introduction of armoured cars and mine-protected APCs in the Border War, the South African security forces made extensive use of 4x4 light trucks as fighting vehicles in numerous configurations including weapons and personnel carriers. Shown here is a Unimog mounting a captured Soviet 12.7mm DShKM heavy machine gun in the wide open terrain of South West Africa. The other light truck of choice was the Land Rover or 'Landie', which came in many guises such as the Sabre with multiple Browning machine guns or the custom-built 106mm recoilless rifle version supplied by the CIA to UNITA. Despite their lack of meaningful protection against mines, both the Unimog and the Land Rover were hugely popular with the troops throughout the conflict, who dubbed the former the 'German Sports Car' and the latter the 'British Sports Car'. (Jim Hooper)

Mine-protected vehicles: Buffel and Casspir

The initial technical reaction by the SADF bore similarities to solutions used in World War II by the soldiers of every warring power. SADF troops packed the floors of their Bedford and Unimog trucks with sandbags and conveyor belts, in the hope of dissipating blast away from themselves, while armour-hulled Eland armoured cars were tasked with leading convoys of more fragile vehicles (an exceptionally unpopular job amongst Eland crews). South African and Rhodesian experience in bush warfare prompted rapid and frequently ad hoc innovation by their militaries, and a number of quick field expedients followed. The Barber programme bolted steel plates onto Mercedes-Benz Unimog truck hulls, whilst the Bosvark (Bushpig) project improved these plates by shaping them into a V. Unimogs also had their tyres filled with water, adding a tonne of weight to the vehicle. Whilst somewhat effective at absorbing and deflecting a mine blast, water-filled tyres were very vulnerable to being sliced open in the rough going of the bush and fell out of use entirely after the development of purpose-built vehicles.

The SADF had barely introduced its first purpose-built Mine-Protected Vehicle (MPV), the Hippo, when it was superseded by improved vehicles jointly developed by the SADF and the South African Council for Scientific and Industrial Research (CSIR), whose mine protection programme was headed by Dr Vernon Joynt. Production for the SADF of the Buffel (Buffalo) MPV began in 1978, whilst the South African Police and units of the South West Africa Territorial Force (seconded to the SADF) began receiving the Casspir (its name an amalgamation of SAP and CSIR) for patrols in mined areas in 1979. These two vehicles would go on to equip the majority of South African motorized units on border patrol duty, and incorporated a number of shared elements in their designs.

With V-shaped raised hulls that channelled blast away from internal spaces, both vehicles provided their occupants far improved protection from mine explosions. Their hulls were themselves strengthened structurally to prevent shattered hull plates either becoming debris or buckling to allow blast in, whilst harnesses and blast-resistant seats were designed to prevent either of the vehicle's occupants from being thrown around by an explosion. Lastly, water and even diesel fuel tanks were integrated into the hull V, to

OPPOSITE
The greatest threat to vehicles throughout the war was the landmine, invariably of Soviet manufacture, such as this TM-46 that contained 5.7kg of TNT explosive, capable of disabling the heaviest AFVs. Indeed the only Olifant tank losses were due to mines, since none were knocked out by direct fire weapons in any tank-vs-tank engagement. Although casualties from landmines diminished, the menace was never defeated. As the final battles of the River Tumpo descended into stalemate, both sides consolidated their respective positions behind extensive minefields that made further offensive operations by either side's AFVs impractical, leading to the eventual political settlement to the war in late 1988. The landmine had prevailed as a decisive weapon of war.

further absorb and deflect the powerful blast of Soviet anti-tank mines – which SWAPO often double- or triple-stacked atop each other. An added benefit of raising the vehicle hull and chassis was that mine explosions did far less damage to the running gear of a Buffel or Casspir. Instead of being written off with multiple casualties aboard, as with previous 'soft' vehicles, MPVs were sometimes so lightly damaged by mine strikes that they required only a change of tyre.

Both Buffel and Casspir featured steel hulls resistant to small-arms fire and, much in the tradition of the ad hoc motorized columns of Operation *Savannah* and the Rhodesian Bush War, were often heavily armed in their own right. Their armament included, but was not limited to: 7.62mm (.30-cal) Browning and FN MAG machine guns, .50-cal Browning M2s, and

B

1: CASSPIR MK 1 of ZULU FOXTROT TEAM, KOEVOET, ELUNDU AREA, OVAMBOLAND, SOUTH WEST AFRICA, MARCH 1982

The Casspir mine-protected APC became the standard equipment of the SAP units operating in SWA to counter insurgents crossing the border from Angola. These SAP units were called Zulu Teams and commonly comprised four Casspir APCs and a Blesbok supply vehicle to allow extended independent operations across the vast open swathes of SWA. This Casspir Mk 1 is the vehicle of the legendary police Zulu Team leader, Lt Frans Conradie. He was in command of Zulu Foxtrot; thus his vehicle call sign was ZF1. The standard armament of the Casspir was twin MG4 7.62mm machine guns on the vehicle roof and a third (on later versions) in the front armoured glass block beside the driver's position. For ZF1, 'Smiler' Conradie acquired a Hispano-Suiza HS.404 20mm cannon as fitted to the de Havilland DH.115 Vampire fighter jet from contacts in the Rhodesian Air Force. This weapon, together with an MG4, provided fearsome firepower over the frontal arc of the Casspir. Below the weapons is a loudspeaker as part of the vehicle's sound system that Conradie liked to use during contacts to play his favourite song – 'Another One Bites the Dust'.

The Casspir is painted in a camouflage scheme of green over the base sand colour. Camouflage depended on the terrain in which the vehicle was operating, with green stripes over sand being the most common but sometimes with a third colour of brown stripes. As there was little air threat, later Casspirs often remained in their factory paint scheme of dark green.

2: BUFFEL APC of BRAVO COMPANY, 32 BATTALION, OPERATION *PROTEA*, ANGOLA, AUGUST 1981

Together with 61 Mechanized Battalion Group, 32 Battalion saw more action during the Border War than any other units in the South African Security Forces. Known simply as 'Three Two', the battalion comprised black Angolan soldiers led by white South African officers and some NCOs. It became the elite light infantry unit within the SADF. Accordingly, it frequently operated on foot or was inserted by helicopter to undertake reconnaissance and offensive operations in southern Angola.

Operation *Protea* was one of the first times that Three Two acted as motorized infantry mounted in Buffel APCs: the reason being that the operational area of *Protea* was inside western Angola to destroy SWAPO command, training and logistics bases around Xangongo. Thereafter, Three Two grew to almost brigade size with five rifle companies, an anti-tank squadron of Ratel 90s, a support company of mortars, heavy machine guns and recoilless rifles mounted on Unimog trucks as well as an anti-aircraft troop of Ystervark 20mm self-propelled vehicles.

Based on the U416-162 Mercedes-Benz Unimog powertrain, the Buffel was introduced in 1978 and became the standard APC of the SADF during the Border War. This vehicle is finished in sand colour with the call sign Two Zero Charlie.

The battalion soon acquired a fearsome reputation and was the focus of much enemy propaganda as 'Os Terriveis' – 'The Terrifying Ones'. But within their own ranks Three Two was known as 'The Buffalo Soldiers' from their unit insignia: a device that was regularly carried on their vehicles as shown here and which often instilled terror in the enemy as the Soviet advisor Lieutenant Colonel Igor Zhdarkin recorded in his diary: '… the Angolan troops are almost completely demoralized … they fear the South Africans like fire and if they hear that "Buffalo" is part of an attack, they throw all their equipment in panic and flee'.

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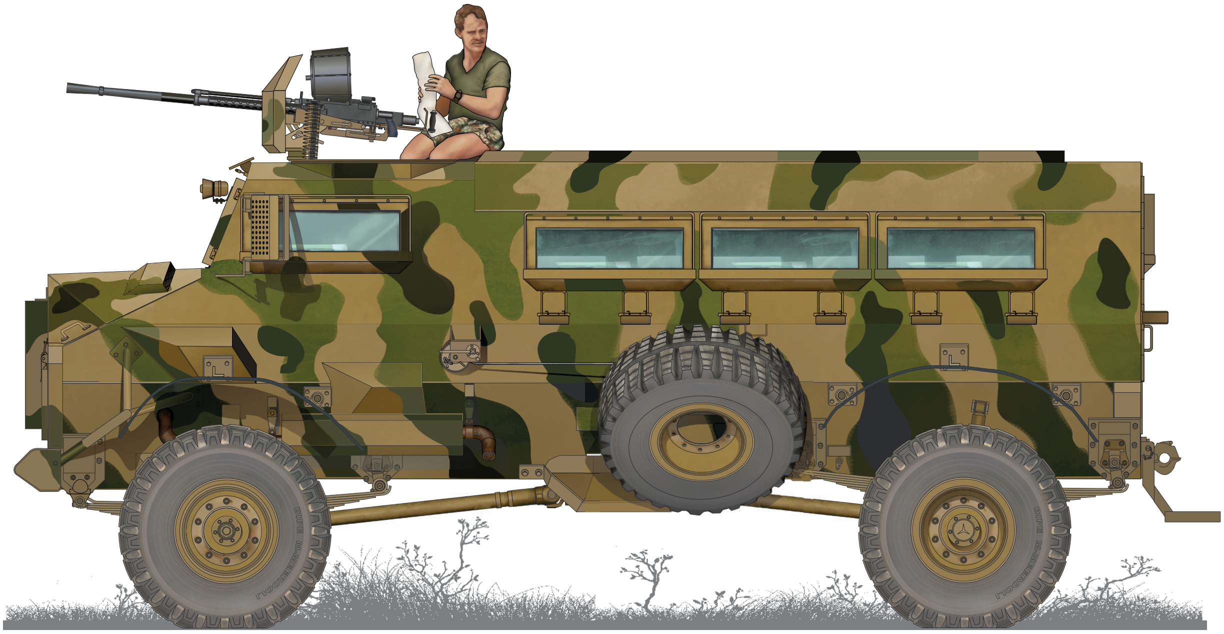

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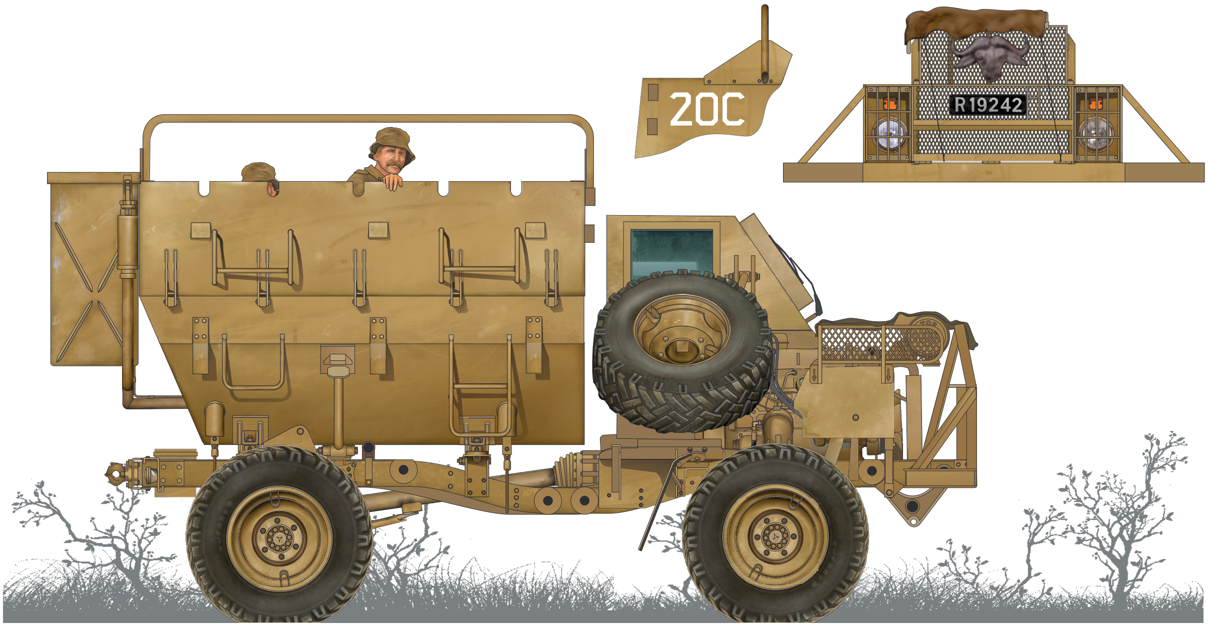
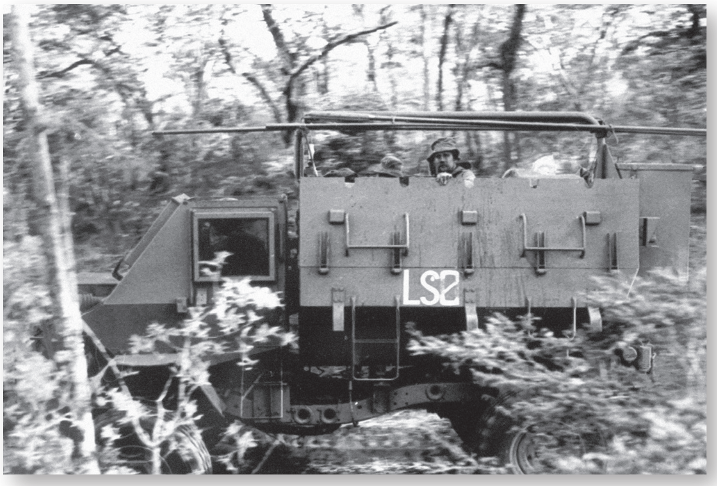




The transport of troops by the Bedford 3-tonner proved impractical in the bush and a purpose-design personnel carrier was soon introduced in the form of the ungainly Buffel or Buffalo. With its widespread wheels and V-shaped hull, the 7-tonne vehicle gave good protection against mines and some 1,400 were manufactured for the Angolan campaign. However, its wallowing motion across country caused some troops to suffer motion sickness, and jumping over its high sides to dismount was a source of injury on occasions. Nevertheless, its open top gave welcome ventilation in the sweltering heat and an RPG penetration often resulted in a 'through-and-through' with little damage to the interior – assuming no one was in the path of the molten jet that the RPG's HEAT warhead produced.

even 20mm cannon. 14.5mm ZPUs captured in Angola were also utilized.

These MPVs did have their fair share of difficult characteristics, particularly their very high centres of gravity which made them vulnerable to tipping. The Buffel was notorious for swaying on its suspension a lot over rough ground or while cornering, and it was not unheard of for SADF soldiers to complain of motion sickness. Though ruggedly built, when breaking through the extremely dense bush of the region, the open-topped Buffel exposed its troops to low-hanging tree branches (especially dangerous at speed) and snakes could even be knocked from trees. Dismounting the 3m-tall carrier over the side of the troop compartment was also a difficult task, especially under enemy fire. The majority of SADF troops did admittedly prefer the open-topped Buffel on a day-to-day basis, given the sweltering heat of the operational area, and subsequent variants of the Casspir usually included roof hatches. Army units gradually re-equipped with the more modern Casspir as the opportunity arose, but the Buffel had proven satisfactory and this replacement was not considered a priority.

The counter-insurgency war against SWAPO

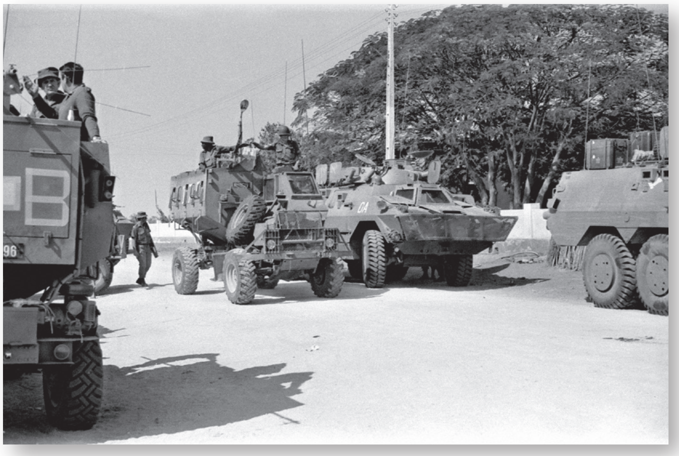
The use of MPVs transformed the counter-insurgency conflict. Patrols were now far better protected against SWAPO's primary weapon, and the rugged bush-breaking ability of both Elands and Casspirs allowed for high-speed tracking and pursuit operations of SWAPO insurgents. Combined with helicopter-borne strike forces, the SADF's strategy of sector-based patrols, coupled with roving Romeo-Mike hunter-killer teams, proved an effective counter to SWAPO infiltration of northern Namibia. The SADF deployed in a broad front across northern SWA in three large sectors. Sector 10 (one-zero) was headquartered at Oshakati and was responsible for the Kaokoland and Ovamboland. Sector 20 was headquartered at Rundu, and was responsible for Kavango, West Caprivi and Bushmanland, whilst Sector 70 was headquartered at Katima Mulilo and was responsible for the eastern stretch of the Caprivi Strip. Of these, Sector 10 was by far the busiest, given widespread SWAPO activity in Ovamboland and the SADF and SWATF (South West African Territorial Force) stationed no less than six infantry battalions there, as well as an engineering squadron. The major base in the sector, at Odangwa, also hosted the main South African Air Force presence in the region, as well as a dedicated surgical wing and maintenance unit. Lastly, the sector also hosted 61 Mechanized Battalion Group, a mechanized force equipped with Ratel IFVs that, whilst it did participate in internal operations, was primarily geared towards large-scale cross-border conventional operations. Sector 70, in contrast, was mostly quiet following the events of 1978, and hosted a single light infantry battalion as well as SADF marines responsible for riverine patrols and an SAAF squadron of Impala light attack aircraft. Sector 20 was patrolled by four infantry battalions and hosted numerous regional headquarters, as well as Buffalo base – the headquarters of 32 Battalion.

In the aftermath of *Savannah*, 32 Battalion had become a formally recognized SADF unit. Under the leadership and training of a number of South African special forces officers, it had been transformed from the ad hoc fighting group of primarily black Angolans into a formidable reinforced infantry battalion equipped with Buffels. 32 Battalion frequently operated with attached armour, particularly Elands and later Ratel IFVs.

The pace of the counter-insurgency conflict in SWA would greatly increase in the years following Operation *Savannah* and the SADF withdrawal from large swathes of Angola. SWAPO sought and received the protection of Angola's ruling MPLA, and sure enough, the predictions of the South African security establishment proved true when SWAPO established large training and logistic bases near the border with Namibia – or at least as close as the SADF and their allies UNITA allowed them. SWAPO recruitment and training picked up considerably, and PLAN fighters infiltrated into Ovamboland in their hundreds in the years following Operation *Savannah*. SADF counters to this included the Romeo-Mike teams, whose search-and-destroy missions relied especially on the mobile firepower of Buffel- and Casspir-borne troops. Where counter-insurgency operations had previously been considered the domain of the foot-borne infantry, motorized and mechanized units could cover exponentially more ground on the flat, albeit very bushy, terrain of northern SWA. Speed and firepower allowed SADF units to deliver a great deal of shock to SWAPO units surprised by the sudden appearance of an SADF column, who were then subjected to an enormous 'firebelt' of suppressive fire, both from mounted weapons and from personal small arms fired over the side of the SADF vehicles, or through their rifle ports. Any RPG gunner brave enough to try to fire back would find the mobile APCs difficult targets, whilst blind small-arms fire was ineffective against Buffel and Casspir hulls. Often, the biggest danger to SADF and police counter-insurgents was the result of the time between contacts, when the fatigue and boredom of long operational deployments was occasionally broken up by the sudden blast of a landmine.

Although the SADF scored numerous defensive successes on its patrols, killing or capturing hundreds of insurgents yearly, the number of incidents and attacks in SWA steadily climbed until it reached a peak in 1980 of 1,152. The flat, bushy terrain of the border region represented a vast operational area for SADF troops to patrol, and emphasis was increasingly put on patrolling within a *cordon sanitaire* within Angola. South African officers considered numerous long-term strategies for winning the war, including the 'strategic hamlet' approach tried by US forces in Vietnam which sought to centralize local populations and prevent their radicalization by opposing

Viewed from the turret of another Ratel, a Ratel-20 goes 'bundu-bashing' through the typical dense bush of Sector 10, characteristic of the terrain in eastern Angola where most of the major encounters were fought. Armed with a 20mm cannon and co-axial 7.62mm machine gun, the Ratel-20 has a crew of three – commander, gunner and driver – and can carry an infantry section of nine men. Weighing 18.5 tonnes combat loaded, the Ratel-20 allows the infantry in the back to observe and engage targets from under armour, while they can debus from the large side doors and through one to the rear above which another 7.62mm machine gun can be mounted. However, the latter was rarely carried in the bush as it was readily torn off by the vegetation.



A command group of Ratels prepare for an operation with infantry-carrying Buffels: the Command Ratel Zero Alpha, denoting the formation commander, has an extra stowage basket attached to its front hull since a command vehicle is invariably full of radios and map boards with little room left for the crew's personal belongings. Note the Buffel driver is in his own compartment, completely detached from the ten troops accommodated in the rear.

insurgent groups. This plan was rejected, given the vast dispersion of local populations across the arid region, a reality necessitated by generations of Ovambo living with little access to water. A 'hearts and minds' approach was tried, and local development initiatives brought medical and educational services to the border, whilst army engineers undertook various infrastructure-building programmes. Callie Harmse, an SADF Infantry School lieutenant at the time, recalls the experience of counter-insurgency deployment to Angola:

> There was an overwhelming feeling of quietness. Deserted towns, bombed out buildings, few locals around. You slept light. It was always hot, and water was always a problem. In winter, it was dry and you were always thirsty until you acclimated enough. In summer, it rained so much that the *shonas* (floodplains) would fill up and trench foot became a problem if you didn't change your socks. Mopani flies constantly bothered you. And your senses were constantly on edge as you looked out for SWAPO, who you knew were better acclimated to this environment and whose senses were sharper than yours in the bush.

The South African Police, meanwhile, viewed the insurgency as a classic law enforcement problem, and cultivated a vast network of informants and other sources of intelligence in northern Namibia. The South West Africa Police (SWAPOL) dedicated Counter Insurgency Unit Operation K (later termed 'Koevoet' or 'Crowbar'), racked up considerable successes by using these sources, as well as 'turned' ex-SWAPO fighters, in an emulation of the tactics used by the Rhodesian Selous Scouts. Koevoet earned a notorious reputation amongst African liberation movements which persists to this day, hardly surprising given the up-close and personal nature of the engagements in which it fought. 32 Battalion likewise earned a notorious reputation for being a battalion which consisted of 'mercenaries and traitors', a characterization brought about by its overwhelmingly black Angolan make-up. This was alluded to in their nickname, 'The Buffalo Soldiers'.

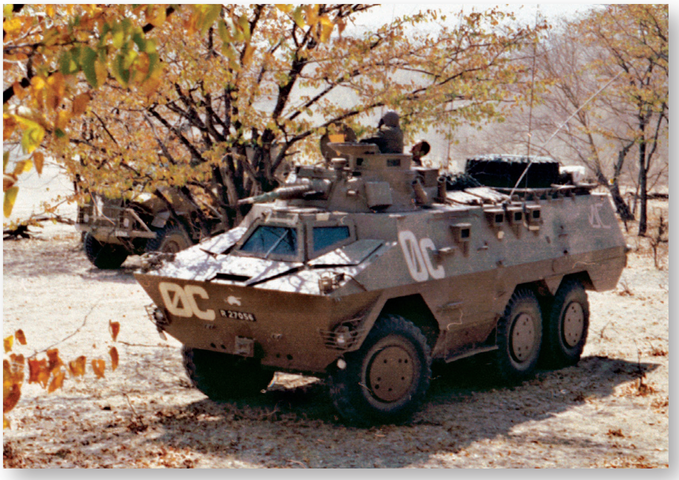
Despite these efforts by the SADF, the Border War was increasingly 'hotting up' in the aftermath of Operation *Savannah*, and it seemed that the best solution to the security dilemma was to launch pre-emptive attacks on SWAPO bases in Angola. This was to not only destroy its insurgent arm but wipe out the entirety of its logistical and training apparatus as well. Although Eland and Buffel would be deployed on these operations, a new armoured vehicle began seeing service that would prove emblematic of the escalated South African involvement in the Border War – the Ratel Infantry Fighting Vehicle.

THE RATEL IFV

The SADF first issued the requirement for the IFV that would eventually become the Ratel in 1970. The SADF at this stage was still focused largely on the use of mechanized forces fighting rapid, mobile warfare as an expeditionary force within Africa. Where the Eland had been considered the heavily armed reconnaissance vehicle for this doctrine, the Ratel was conceived as a vehicle to mechanize the SADF's infantry and bring them into line with the modern SADF conception of warfare by fire and manoeuvre. When the SADF began evaluating foreign vehicles for this role in 1971, the vehicle used as the baseline was the British-designed Saracen APC. Vehicles considered included the Brazilian EE-11 Urutu, Belgian Berliet VXB-170, German Thyssen Henschel UR-416 and the M3 from Panhard, with which the SADF already had a warm relationship. However, it soon became apparent that the SADF did not seek to merely replace their existing APC with another APC, and the army was not happy with any of the foreign designs for a myriad of reasons. It ultimately fell to a local branch of Büssing, the bus and truck branch of the MAN industrial group, to develop a new vehicle based on a modified 6x6 truck chassis which fulfilled the SADF's requirements. After examination of the mild steel prototype by the SADF, three armour steel prototypes were ordered, and one was subjected to full destructive testing. Satisfied that the new Infantry Fighting Vehicle had met the army's requirements, the Ratel (Honey Badger) entered full-scale production in 1975 at Sandock-Austral (who by then had established themselves as the primary South African armoured vehicle producer), just as the events of *Savannah* were reaching crisis point.

The basic premise of the Ratel was that it would not serve as a mere 'battle taxi' – instead, it would carry its infantry into battle and, from there, the infantry would fight from within or alongside it in a battle of fire and manoeuvre. To this end, the Ratel was designed from the ground up as a dedicated infantry fighting vehicle, and together with the Soviet BMP-1 and the West German Marder, can rightly be counted as part of the ground-breaking first generation of these vehicles. Unlike the Soviet and German vehicles, however, which faced each other over the open plains of Germany, the Ratel was expected to have to drive many hundreds or even thousands of kilometres across Africa to fight. The South African military to this day shows a preference for wheeled vehicles in all but the heaviest military roles, due to the excellent strategic mobility this affords them.

Ratels, for example, were often transported by train to the major SADF logistics base in Grootfontein, SWA. But when trains were not available, Ratels could simply drive the 2,000km instead, at minimal mechanical cost. To highlight this advantage in contrast to tracked vehicles, which require new tracks and other extensive overhauls every 10,000km, the Ratel required an overhaul at 50,000km. The Ratel's 6x6 drive was coupled to a 12-litre straight-six turbo-diesel (producing 308hp) that gave the Ratel a road speed of some 110km/h, whilst off-road it was far superior to the Eland. The Ratel's excellent ground clearance meant that it bogged down far less frequently than the Eland, even combat-loaded at 18.5 tonnes. The 1+2 arrangement of the



The Ratel series was a South African-built infantry fighting vehicle for the South African mechanized infantry battalions for operation in the flat, open plains of the country. As such it was not designed for the extremes of the Angolan campaign yet it was to prove a highly successful AFV in a multitude of roles. It entered service in 1978 just as the Angolan War was expanding significantly and was first employed in action during Operation *Reindeer*. With its call sign Zero Charlie, this is a Ratel Command with a different turret offering increased direct visibility and armed with a Browning .50-calibre and a co-axial 7.62mm machine gun.

KOEVOET

Over the years, the Border War involved two distinct campaigns. The first was conducted in South West Africa against SWAPO and PLAN insurgents from Angola infiltrating across the border and terrorizing the local population through intimidation, assassination and the widespread laying of mines to kill hapless motorists and patrolling security forces. The second campaign was of a more conventional nature against the combined Cuban/FAPLA forces in Angola. Initially, the South African Police (SAP) was hard-pressed to contain the infiltrators, so a specialized Counter-Insurgency (COIN) unit based on the Rhodesian 'Selous Scouts' and the Portuguese *Flechas* or 'Arrows' was formed in June 1979. The brainchild of a veteran of the SAP Security Branch, Colonel (later Major General) Johannes 'Sterk Hans' Dreyer, the unit was originally called 'Operation K', but soon became known as *Koevoet* – the Afrikaans for Crowbar. In the words of the then Minister of Law and Order, Louis le Grange – 'The crowbar which prises terrorists out of the bushveld like nails from rotten wood'.

Koevoet, pronounced 'Koo foot', was manned by a multi-racial mixture of regular policemen, police reservists, special constables, with the black personnel mainly drawn from the Ovambo tribe that straddled both sides of the border. Accordingly they spoke the local language, understood the tribal culture and were intimately familiar with the terrain, as well as having extraordinary tracking skills – honed since childhood, when they were put in charge of their family's livestock and if any beast strayed they were responsible for finding and retrieving it. In total there were some 300 white and 900 black personnel plus support staff. These were divided into 24 Zulu Teams designated alphabetically from A to Y with the Koevoet Headquarters at Okave in Oshakati. There was no Zulu Romeo or Zulu Zulu. Subsequently more teams were raised with the prefix Zulu One operating out of Ongwediva; Zulu Four at Rundu in western Kavango and Zulu Five at Opuwa in western Ovamboland. Each team usually comprised four white and 40 black personnel; overall, the ratio was 1:10. Koevoet teams commonly spent one week on operations and one week at the bases in Kaokoland, Kavango and Ovamboland.

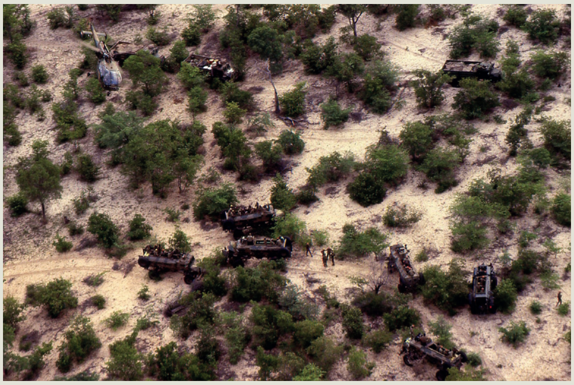
Contact! The Koevoet team drops inside the Casspir to grab their weapons. Each Casspir had at least four machine guns to fire through the side ports, known as 'pigeon holes', to provide instant suppressive fire in an ambush or during an attack. The side vision blocks give excellent visibility from inside compared to most AFVs and greater protection than the 6mm-thick armour of the Casspir's hull. The latter was proof against ball ammunition but the greatest threat to the vehicle was the RPG and the more widespread Yugoslav M60 anti-tank rifle grenade. (Jim Hooper)

Other members of the team use their assault rifles from the open top of the Casspir to engage targets of opportunity with aimed fire. The weapon of choice was the 5.56mm R5 with a 50-round banana clip and folding stock for easier handling inside the vehicle. With ten automatic weapons firing from the sides and up to three machine guns from the front, a ferocious level of firepower was produced to counter any ambush. (Jim Hooper)

In 1980, the Casspir became available in quantity – replacing the mine-protected, enclosed, top-heavy Hippo – and Koevoet became fully mobile, organized into platoons of 40–50 men each equipped with four Casspirs (later supplemented by Wolf Turbos) and support vehicles including Blesbok and Duiker variants of the Casspir. Manned by two men and with a five-tonne payload, the Blesbok carried ammunition, rations, spare parts and fuel, both for the Casspirs and JP-4 AVTUR to replenish supporting SAAF helicopters in the veld. The Duiker was a 5,000-litre diesel bowser for refueling in the field or pre-positioned at safe locations to support Koevoet patrols, but it was seldom deployed on operations. The combination proved formidable and in 1980 Koevoet killed 511 insurgents at a cost of just 12 policemen. The kill ratio increased year by year.

The key to Koevoet's success was intelligence gleaned from 'PBs' – *Plaslike Bevolking* – Afrikaans for 'local population', living in isolated and far-flung *kraals*. Most of the time the intelligence was second- or third-hand via the bush telegraph, which meant having to stop at one *kraal* after another, to question the PBs for more definitive info, which was often no more precise than 'Yes, I

Once the ambush is suppressed, the team dismounts to search for survivors. The trackers fan out to find any sign of the enemy and the hunt begins. The chase is relentless and can last for hours, even days, depending on the anti-tracking skills of the quarry. There are no hiding places and retreating across the border back into Angola provides no refuge as Koevoet employs a policy of 'Hot Pursuit' until the enemy is brought to book – either death or capture. (Jim Hooper)



Two Koevoet teams close in on their quarry in typical bush terrain as an 'Alo' helicopter circles overhead. In the foreground are five Casspirs and to the right a Wolf Turbo while in the background are three Blesbok supply vehicles laden with ammunition, rations and fuel. Of interest, some of the Koevoet troops have turned their field caps inside out to reveal a Day-Glo yellow or orange crown as a recognition sign to SAAF helicopters to prevent blue-on-blue mishaps. (Jim Hooper)

saw three men with guns four days ago, going south.' It was then vital to act on the information quickly in order to track them down. Since the insurgents were invariably on foot, the Casspir-mounted Koevoet units held a significant advantage in mobility, armour protection shock action and overwhelming firepower. Once in pursuit of their quarry, the Koevoet teams let loose the Ovambo trackers or *spoorsnyers*: in Afrikaans literally meaning 'sign cutters'. Their ability to uncover even the slightest sign of the enemy was phenomenal. Once found the team was now 'running spoor' and the chase was on. The trackers on the ground could quickly determine the direction of travel and invariably tell if the spoor was made by a man or woman, civilian farmer or an armed insurgent: all left different footprints and whether they were walking or running. At all times the trackers were flanked by Casspirs in case of ambush. Meanwhile, half the team would conduct *voorsny* – literally 'cutting ahead' by driving one or two kilometres forward to find fresher *spoor*. If found the trailing team mounted up and joined the leading group. The process of leapfrogging was then repeated, with the gap between the pursuers and the quarry diminishing all the time. When they could hear the cars, it was common for the insurgents to 'bomb-shell', each taking off in a different direction.

On closing with the target, Allouette III gunships armed with a door-mounted 20mm cannon or machine guns were scrambled to scout ahead of the Koevoet team, forcing the insurgents to take cover every time the 'Alos' passed overhead and thus slowing their escape. The outcome was predictable, with the exhausted, outnumbered and outgunned insurgents facing either death or capture. The latter was preferable and many SWAPO insurgents were 'turned' to become Koevoet special constables. Indeed employment with Koevoet was highly sought after among the Ovambo as the pay was good, and supplemented by a bounty for insurgents killed or captured, payable only to black Special Constables. There were further bounties paid on captured equipment, running up to R10,000 for a SAM-7 man-portable anti-aircraft missile.

Like 32 Battalion, Koevoet was subject to extensive enemy propaganda because of its ruthless efficiency with a final kill ratio of 25 to one; having eliminated an estimated 3,225 insurgents in some 1,615 engagements. In late 1989, both units were unceremoniously disbanded as part of the peace treaty negotiations that ended the Border War. There was no place for Koevoet in the new state of Namibia or 32 Battalion in the South African National Defence Force.

The hunt is over as two SWAPO soldiers are captured and searched. Since there is a bounty or 'kopgeld' – head money – of R1,000 for a dead insurgent but R2,000 for a live one, the incentive was to take the enemy alive for intelligence purposes. After a preliminary interrogation, those with aptitude and inclination were persuaded to join Koevoet while the remainder became POWs working on the Koevoet farm near Tsumeb, north of Windhoek – the capital of South West Africa. (Jim Hooper) wheels meant that it could cross trenches 1.15m wide, but it was likely to get stuck in wider ditches – pitching nose-first into the trench and 'airing' all of its drive wheels. These faults aside, Ratel crewmembers soon grew exceptionally fond of and confident in their new vehicle.

The principal IFV variant of the Ratel was armed with the GI-2 20mm autocannon manufactured by Lyttleton Engineering Works, which was derived from the GIAT F2. Utilizing a powerful 139mm cartridge, the cannon produced a muzzle velocity of 1,100m/s with 134 gram projectiles, and fired at a rate of some 750 rounds/minute. The Ratel was one of the first IFVs in the world to feature a twin-linked ammunition feed, which allowed its gunner to swap between tungsten-cored armour-piercing (AP) and HE rounds at the flick of a switch as the tactical situation demanded it. The AP round could easily penetrate lightly protected vehicles like BRDM reconnaissance vehicles and BTRs encountered in Angola, whilst the HE round could chew apart lighter targets like trucks or trees. The gun was mounted in a variant of the AML turret (offered to the SADF as the never-adopted AML-20) fitted with a mantlet designed for the autocannon and otherwise modified to accommodate the ammunition belt feed of the GI-2. Additionally, the new turret included a raised commander's cupola, which provided excellent visibility.

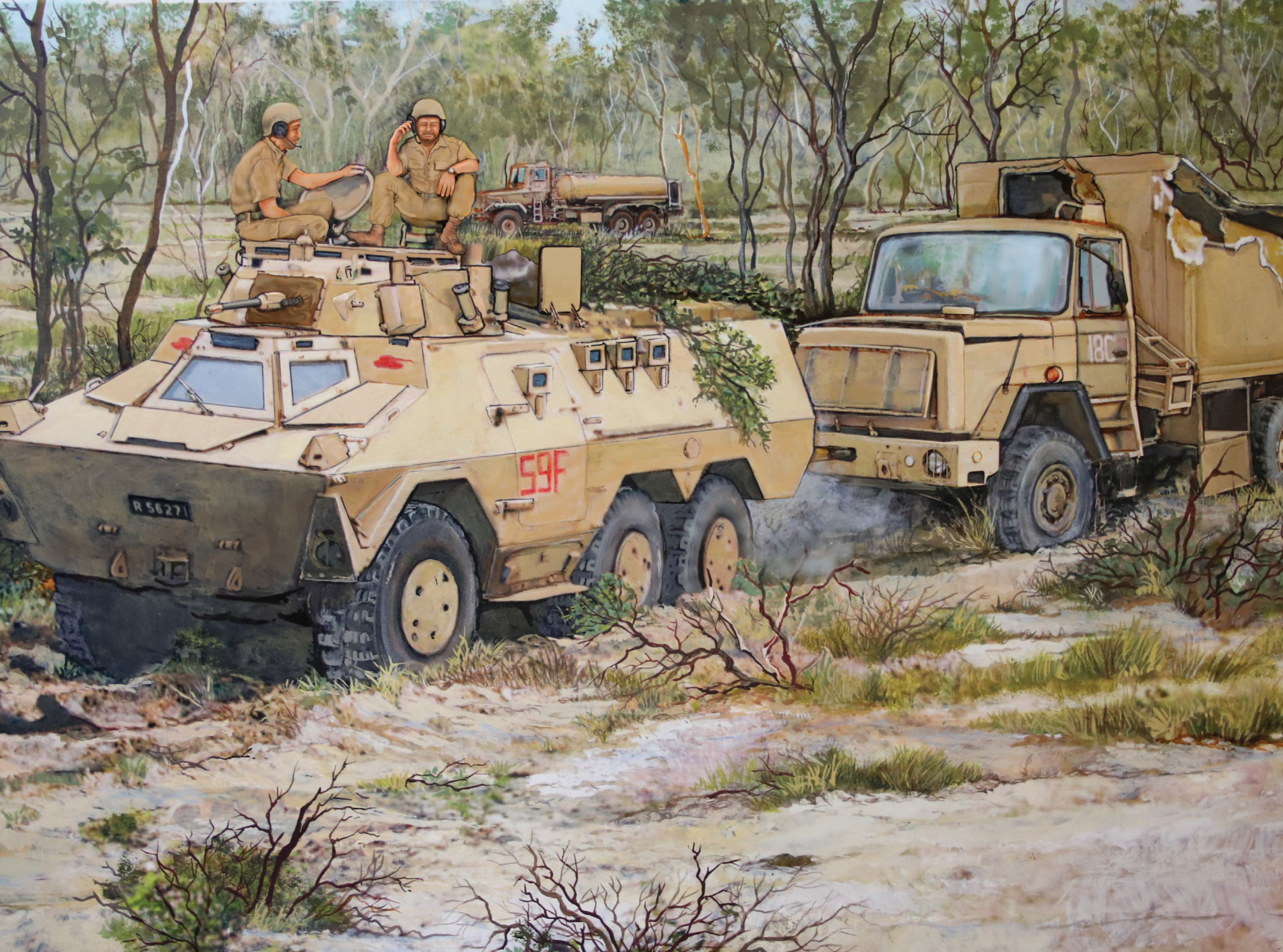
Located behind the turret was the infantry compartment, which featured back-to-back seating for eight infantrymen. The infantry section had access to six view- and rifle-ports, and had several options for dismounting. Directly above were five hatches, whilst a door to either side of the turret basket allowed troops to dismount from the sides. Finally, a rear 'tunnel' past the left-and-rear-mounted engine allowed troops to dismount via a rear door as well.

Defensively, the Ratel's primary asset was its speed and manoeuvrability. It was intended to fight on open South African plains, using firepower to suppress any enemy it could tackle head-on and mobility to avoid formations that may be equipped with heavier foes like tanks. To this end, it was armoured only to resist small-arms fire and low- to medium-energy fragmentation from shell

C

RATEL COMMAND VEHICLE, E SQUADRON, SCHOOL OF ARMOUR, OPERATION *MODULER* , ANGOLA, DECEMBER 1987

The deployment of a tank squadron to Angola in October 1987 necessitated a significant logistical commitment to keep the Olifants operational so far from conventional repair facilities. Much of the responsibility to provide spare parts and ammunition for the tanks lay with the Squadron Sergeant Major, Jacques de Wet – one of the most experienced NCOs in the South African Armoured Corps and an endless source of jokes. The appalling terrain encountered in Angola soon presented some unforeseen problems such as excessive track wear due to the highly abrasive sandy soil. It was quite impossible to transport new tracks to the frontlines for the 13 Olifants and two Armoured Recovery Vehicles so a solution was found: replacing every single trackpin, an onerous task supervised by Sergeant Major de Wet. The latter's usual form of transport was a Ratel Command Vehicle with its call sign of Five Nine Foxtrot: Five Nine denoting the Headquarters element. Armed with a .50-cal heavy machine gun, the command vehicle also carries red tank silhouettes denoting E Squadron, School of Armour. Prior to the deployment of E Squadron, the commandant of the School of Armour advised the squadron commander to add a pantry truck to the unit's establishment. Based on the Samil-50 series of 5-tonne 4x4 logistic vehicles, the pantry truck provided cooking facilities and, more importantly, refrigeration. The value of this was reflected in the going exchange rate of four cold beers for six warm ones. Once word got out, the refrigeration unit was used by the medics to keep whole blood and plasma cool, so One Eight Charlie became a vital part of the task force. As such it was necessary to tow the pantry truck once it was badly damaged by passage through thick vegetation.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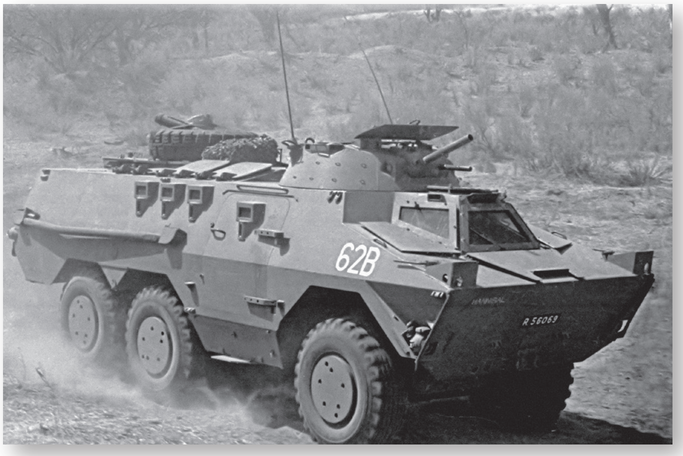
bursts. The 20mm steel plate on its well-angled nose, for example, was only rated to protect against 12.7mm machine gun fire, whilst its sides were only 10mm thick. A necessary compromise to enable its mobility, the Ratel was nevertheless somewhat vulnerable in the close-in 'knife-fighting' in which the SADF would find itself embroiled in the coming years.



The Ratel series encompassed several variants including this Ratel-60 that marries the turret of the Eland-60 and the hull of the Ratel: its call sign indicates that this is an artillery observation post or AOP acting to coordinate fire support in the forward combat zone. This was an aspect in which the South Africans excelled with their ability to coordinate their limited resources of artillery and ground air support to maximum effect as a force multiplier at any point of contact.

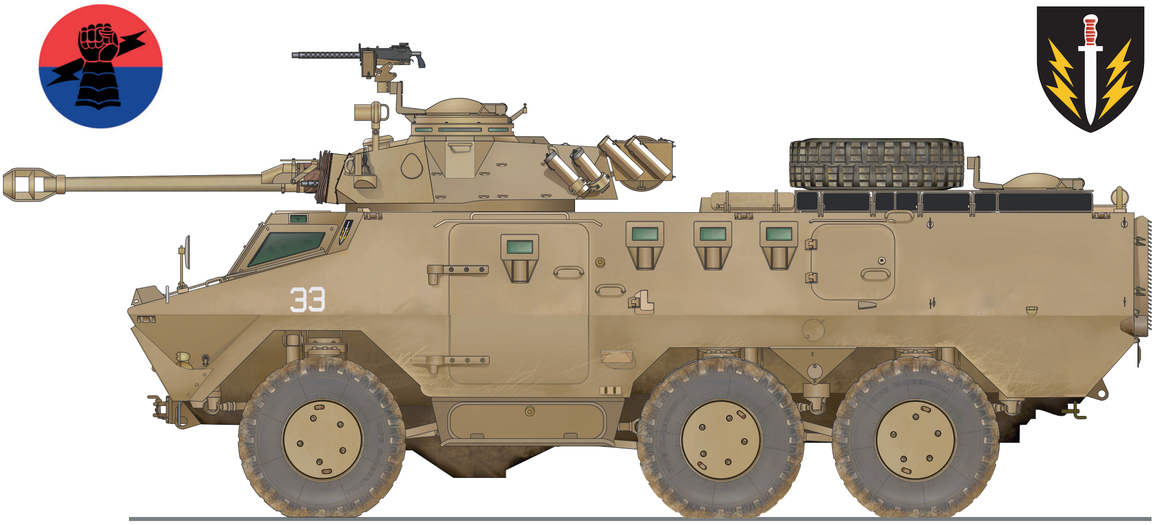
Ratel variants

SADF experience with modularity in the Eland had meant that the Ratel had been designed from the beginning with multiple variants in mind. The base Eland-60 turret was compatible with the Ratel, producing the Ratel-60, which served with distinction in a support role and as an artillery observer's role. To the joy of the infantry battalions, the Eland-90's turret also mated with the Ratel (albeit with a strengthened hull), producing an extremely handy anti-tank complement organic to their units. The Ratel-90 overcame two major disadvantages of the Eland, namely its shortage of ammunition storage space and its low ground clearance, with the Ratel stowing 72 rounds of HE and HEAT in its ammunition racks. And though the Eland could both get bogged down in tough Angolan terrain, whilst also struggling to see over bush, the Ratel was far more mobile than the Eland over rough ground and had a far higher vantage point. Whilst arguably a disadvantage in open terrain, the high silhouette of the Ratel-90 provided its crews far better visibility over and through dense undergrowth. The Ratel-81 dispensed with

D

RATEL-90, C SQUADRON, COMBAT GROUP ALPHA, 61 MECHANIZED BATTALION GROUP, OPERATION *MODULER* , ANGOLA, OCTOBER 1987

Although originally designed as an Infantry Fighting Vehicle (IFV) for the wide-open plains of southern Africa, the Ratel won its spurs during the Border War. The Ratel-90 was the fire support version of the IFV created by replacing the standard 20mm cannon turret with the 90mm turret of the Eland armoured car (see Plate A). The 61 Mechanized Battalion Group was another elite SADF unit that was central to most of the 'external' operations in Angola. As the name implies, the battalion grew in size until it comprised two mechanized infantry companies, each with three sections of four Ratel-20s; an armoured car squadron with 12 Ratel-90s in three troops; an artillery battery; an anti-tank platoon; an anti-aircraft troop; and supporting elements. Late in the war, a tank squadron was occasionally placed under operational command. With its call sign Three Three, this Ratel-90 denotes the troop leader of Three Troop C Squadron. To the front and rear it carries the insignia of 61 Mech as well as that of the Armour Branch. In the middle of the plate is the unofficial shoulder patch adopted by C Squadron. All the Ratel-90s within the squadron were named after famous tank commanders such as PATTON and ROMMEL or famous tanks such as PANTHER and KING TIGER – the latter given to Three Three. The Ratel-90 has a crew of three with driver, gunner and commander/loader: in Three Three the driver was Trooper Glen Woodhouse; the gunner Trooper Kurt 'Stompie' Oelofse and the commander Lieutenant Adrian Hind. These men were involved in one of the most decisive armoured engagements of the Border War, fought on 3 October 1987 during Operation *Moduler*. On that day the Ratels of Combat Group Alpha, including Charlie Squadron, inflicted severe losses on the FAPLA 47 Brigade, with 250 confirmed killed as well as 18 tanks, 46 other AFVs, and 85 trucks destroyed or captured. South African casualties were minimal, but KING TIGER was one of them when it was knocked out by a T-55. Troopers Woodhouse and Oelofse were seriously injured while Lieutenant Adrian Hind was killed. The latter is commemorated at the Hind Memorial in the Johannesburg Museum of Military History.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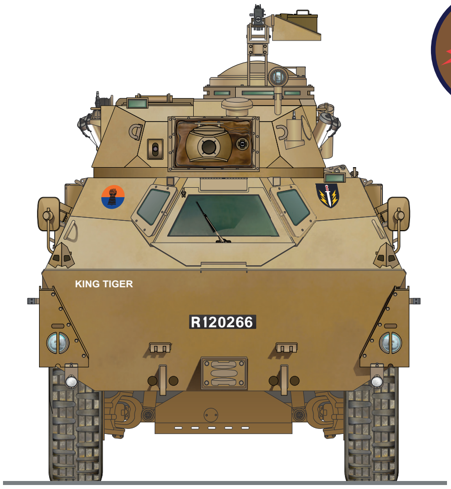
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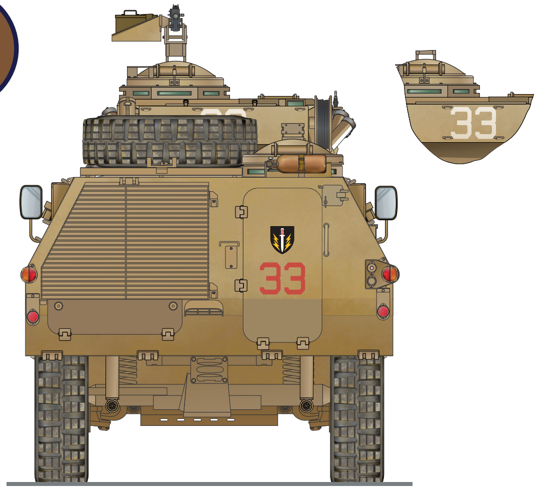
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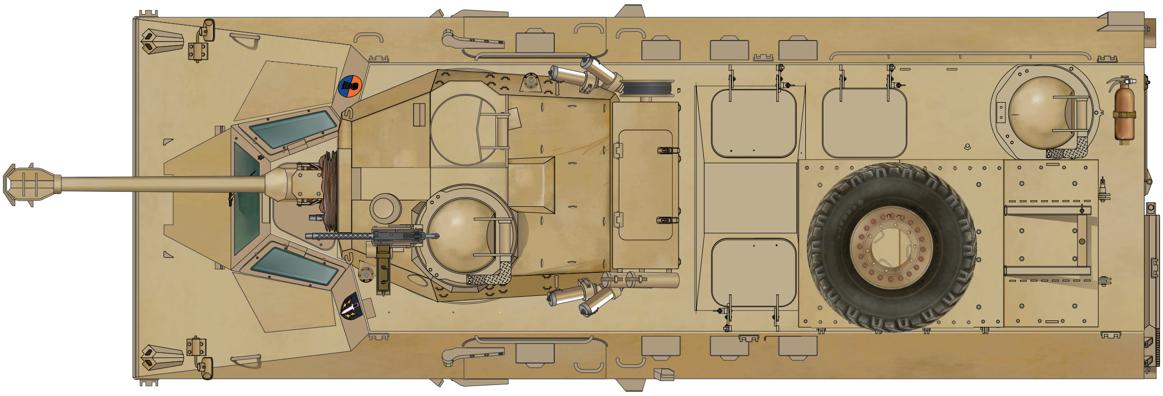


The weapon most feared by Ratel crews was the ZU-23-2 anti-aircraft gun, firing in the ground role. Masked by vegetation in a weapons pit with its gun barrels just feet above ground level, it was nigh on impossible to spot such an emplacement before it opened fire at a rate of 200 rounds per minute per barrel. Such a fusillade would shred a Ratel, as happened to Nine Golf of 61 Mech during Operation *Sceptic* on 10 June 1980. One survivor, Trooper Marco Caforio, recounted: 'When Nine Golf was suddenly struck by 23mm rounds which blasted through the Ratel's front I was wounded by fragments and bailed out from the stricken vehicle. After being wounded twice more I was picked up by Two Three Alpha which was then struck by 14.5mm rounds, one of which penetrated six inches away from my face.' Caforio was wounded a total of four times. Seven other troops died in Nine Golf.

a turret entirely, mounting an M-3 81mm mortar on a turntable which replaced the infantry compartment. It fired the 4.43kg M-61 high-explosive round to a maximum range of 4,850m, and provided mechanized infantry battalions a potent 'in-house' artillery component capable of both air-bursting HE and smoke-concealment fires. The Ratel Command variant was armed with only a .50-calibre M2 and a co-axially mounted .30-calibre Browning in its turret, to give more space inside and allow for the mounting of extra radio equipment. The final Ratel variant was the ZT-3, a dedicated tank destroyer armed with a modern anti-tank missile, but it would only enter pre-production in 1987.

THE CROSS-BORDER RAIDS 1978–84

The units of the South African Infantry (SAI) Battalions began receiving their Ratels through the mid-to-late 1970s. Manned mostly by conscripts performing their national service, SAI troops, like the rest of the SADF, were some of the most intensively trained soldiers in the world. 1SAI was one of the first of the Ratel-equipped battalions to deploy operationally to the border, where the SADF was increasingly launching aggressive patrols into Angola in a bid to pre-empt ever-accelerating SWAPO infiltration.

Operation *Reindeer*, 1978

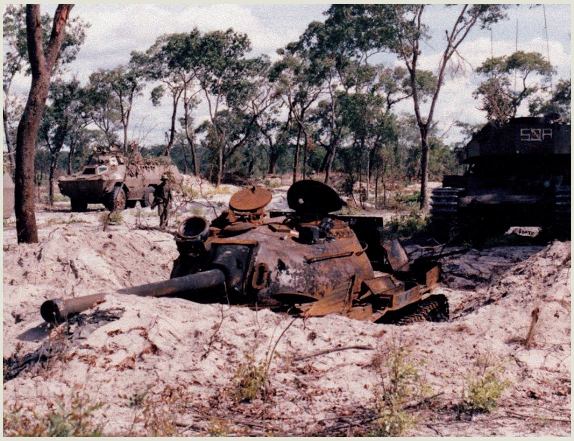
After a round of operational testing, 1SAI was deployed on an ad hoc rescue mission for a South African sapper who had been snatched from across the border, but the Ratel's first full-scale, sanctioned and planned offensive operation was Operation *Reindeer* on 4 May 1978. Now best remembered for the airborne assault at Cassinga, *Reindeer* included a full-scale mechanized attack on SWAPO's 'Vietnam' base at Chetequera, conducted by Combat Group Juliet, which included 23 Eland-90s and 31 Ratel-20s of 1SAI.

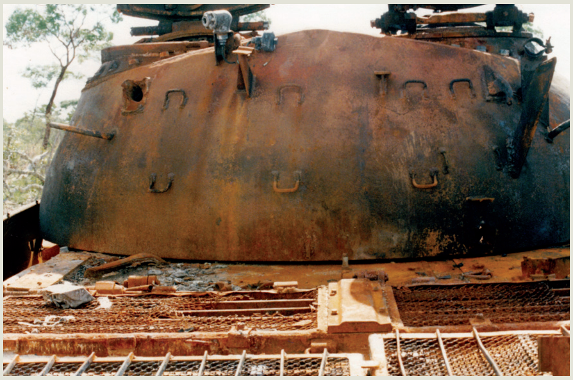
'Vietnam' was constructed on Soviet lines, with an extensive trench system protecting the base, and the main assault was proceeded by an air attack conducted by SAAF Canberra and Buccaneer strike aircraft. The assault force then attacked the base, using the Elands' 90mm guns, 81mm mortars and the Ratel's 20mm autocannon to suppress the defenders, who were mostly equipped only with small arms. Juliet's infantry units then fought from the Ratels, using hand grenades, rifles and machine guns to systematically clear the trenches. The SADF's serious advantage in firepower resulted in an exceptionally lopsided battle, with two dead on the South African side and 248 SWAPO killed in action at Chetequera, with an additional 202 captured. Juliet's success in this operation (resulting in SWAPO incidents in Ovambo halving that year) resulted in the unit receiving a permanent operational designation as 61 Mechanized Battalion Group, and it would, along with 32 Battalion, serve as the SADF's premier mechanized strike force within Angola.

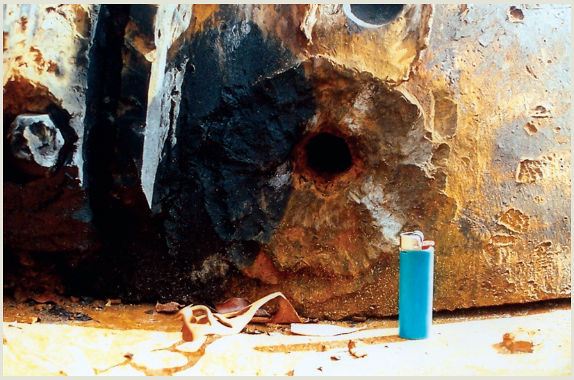
Operation *Sceptic*, 1980

The year 1979 had been a frustrating one for external operations against SWAPO, who had evaded major battles with the SADF and had managed to redouble its efforts and return to substantial strength. When the SADF launched a major attack (in Operation *Sceptic*) against 'Smokeshell' base near Chitumba in June 1980, the SAAF attack which preceded the ground assault drew substantial 23mm cannon and SA-7 missile fire. *Sceptic*, which began on 10 June, was to involve 61 Mech, by now equipped with Ratel-90s, attacking what was thought to have been a single base sited above-ground. Instead, it was a complex of training camps spread out across 40sq km and was heavily dug in and fortified. The first encounter was bloody: one company of 61 Mech's Ratel-20 infantry carriers encountered 23mm and 14.5mm anti-aircraft guns firing in an anti-ground role. Four Ratels were hit, with one in particular, Nine Golf, being raked repeatedly by 23mm rounds. Seven SADF troops aboard were killed, but the attackers rallied and silenced the guns by sighting on their muzzle blasts. Rifleman Bradley Futter, the gunner of Ratel-90 call sign Seven Two Bravo, recalls the battle:

The Olifant squadrons with their overwhelming firepower proved to be a decisive force multiplier in the final battles of the Border War that was recognized by all levels of the command structure after years of dismissal of armour, and despite the extensive use of MBTs by the enemy. Initially, tank crews advanced with an APFSDS-T round chambered in the main armament in case they suddenly encountered an enemy tank, but it was soon found that at the typical short ranges of engagement such a projectile would pass completely through a target with no immediate appreciable result, although the opposing crew would invariably have been killed. Accordingly, HEAT became the round of choice in any encounter since a strike on target would result in a certain discernible hit and a subsequent conflagration. Although a HEAT round could be prematurely detonated by the vegetation it passed through, this was exploited against infantry targets by exploding a round in the trees above such emplacements.


Despite sheltering in a tank scrape, this T-54M was destroyed by a fin round passing through the sand berm and penetrating the turret.


While attempting to retreat, this T-54 was penetrated twice by a 105mm APFSDS-T or 'fin' round at top left and lower right of the turret.


Here, a 105mm HEAT projectile has penetrated the thickest part of the turret front of a T-54. A cigarette lighter provides a scale for the impact.

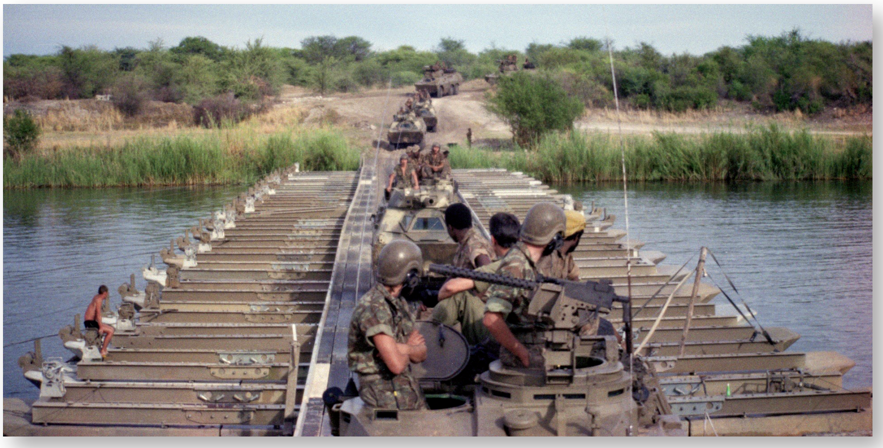
> There was a lot of noise and confusion ahead of us when we got the order to fire. Once we did, we were hitting targets at close range. Smoke and dust filled the turret, and the smell of cordite was overpowering. It was extremely hot and tense. Our crew commander would throw our empty shell casings out of the pistol port, and the entire battle lasted several days.

In the confusion, SWAPO troops broke and fled, with 76 PLAN insurgents killed in the three-hour fight at the cost of 14 South African dead and 24 wounded, mostly in three knocked-out Ratels. 32 Battalion's various combat groups were called in from their allocated tasks and over the next 18 days, 61 Mech, 32 Battalion and the paratroopers attached to both units set about clearing the Smokeshell complex, resulting in an additional 304 SWAPO and three SADF deaths. The SADF also briefly skirmished with a FAPLA mounted column which had attempted unsuccessfully to attack the South Africans as they withdrew. This development pointed to increasing FAPLA protection of SWAPO units and camps within Angola, and a willingness to engage the SADF on behalf of their ideological allies.

Operation *Protea*, 1981

By 24 August 1981 – the launch day of Operation *Protea* – FAPLA was actively protecting SWAPO camps. Far from dissuading the SADF from attacking, the South Africans were instead prepared for semi-conventional battles against the 11th and 19th FAPLA brigades stationed near Xangongo, Mongua and Ongiva. FAPLA's brigades were organized on Soviet lines and roughly equivalent to a Motorized Regiment with three battalions of infantry, with organic tank, artillery and reconnaissance support. Unlike lavishly equipped Soviet units, however, the Angolans had to make do with a single company of tanks per brigade – T-34/85s in the case of the 11th and 19th Brigades. As per previous operations, the attacks on the SWAPO camps were preceded by air and artillery bombardments which drove the camp defenders into their trenches, bunkers and foxholes. This assault, however was complicated by the presence of FAPLA T-34/85s, which were overcome through superior South African tactical handling of their armour.

Elands and Ratel-90s manoeuvred in four-vehicle troops in order to spot FAPLA tanks first and engage them with overwhelming firepower. Poorly coordinated, FAPLA tanks were frequently caught either attacking or



As part of Operation *Moduler*, 32 Battalion was deployed to the Tumpo area to thwart the expected FAPLA/Cuban offensive against UNITA positions at Mavinga and beyond. Here, the Ratel-90s of the anti-tank squadron of 32 Battalion (see Plate D) cross the Kavango River to rejoin the rest of the battalion on 21 August 1987. This sub-unit was to prove decisive during the coming fighting and a Ratel-90 achieved its first armour victim when it destroyed a BTR-60 of the FAPLA 21 Brigade on 9 September during the first phase of Operation *Moduler*. At this time, 32 Battalion comprised five motorized infantry companies mounted in Buffels; the anti-tank squadron with Ratel-90s; a support company in Unimogs and a single anti-aircraft troop with Ystervarks (see Plate G).

defending in ones or twos, and as 61 Mech and 32 Battalion manoeuvred through FAPLA and SWAPO static defences, multiple SADF vehicles were usually in a firing position. These armour clashes accompanied the destruction of the camps' defences in depth, as infantry and armour cooperated to clear trenches, bust bunkers and demolish above-ground structures. The SADF's opponents fought bitterly and bravely in the face of overwhelming firepower, with one bunkered outpost south of Xangongo withstanding air and artillery bombardments and keeping the attackers well suppressed with a 23mm anti-aircraft gun before finally being overcome.

Combined FAPLA/SWAPO dead totalled some 831, at the cost of ten SADF killed and some 64 wounded. A constant asset for the SADF was its extremely efficient casevac service, which meant most of its seriously wounded began receiving care within the 'golden hour'. This, coupled with the SADF's vastly superior firepower, explains the greatly disproportionate death rates in these bitter and brutal battles. The SADF captured a substantial haul of FAPLA equipment including around a dozen T-34 and PT-76 tanks, along with a large fleet of supply trucks and other heavy weapons. A substantial portion of these and other SADF captures were redirected to UNITA, making exact numbers difficult to verify.

Operation *Protea* was followed up by *Daisy* and *Mebos* in 1981 and 1982 respectively, and the collective effort largely suppressed SWAPO's operations in those years. But with SWAPO again gaining strength and supplies for yet another offensive in 1983–84, the SADF prepared Operation *Askari* which was conceptually a repeat of *Protea*, this time aimed at SWAPO operations near Cahama, Mulondo and Cuvelai.

Operation *Askari* , 1983

The opening attacks of Operation *Askari* began on 6 December 1983 and initially went smoothly as the SADF skirted Angolan forces to attack SWAPO camps in a similar manner to *Protea*, but through late December and early January FAPLA intervened with heavy Cuban support. The 2nd, 11th and 19th Brigades had been re-equipped with T-55s, and the South Africans now found themselves facing far tougher targets. After taking the camps at Cahama and Cuvelai, Ratel-90s and Eland-90s beat off two tank counter-attacks backed by BTR-borne infantry. Against the T-55, multiple hits were often needed to find a 'sweet spot' and only mobility, teamwork and communication prevented the light South African armoured vehicles from being knocked out by their far heavier opponents. Whilst probing for a good HEAT hit, other vehicles in SADF formations would fire their HE rounds at the T-55's optics to blind it. If multiple coordinated HEAT hits did not knock it out, the SADF vehicles would retreat back into the bush and then use their mobility (coordinated by radio) to make shots on the T-55 to its exposed side or rear, preferably while its turret was pointed in another direction

Then, on 4 January 1984, a major counter-attack with ten T-55s began at Cuvelai. A single Ratel-20 (call sign One Three Bravo) became bogged down in a minefield and was knocked out by a T-55 (with six SADF troops aboard killed) before the attack was driven off with artillery and a counter-attack by the other Ratels, which eventually accounted for all the attackers. The SADF withdrew after taking control of Cuvelai, again with a massive haul of captured goods, by mid-January. In all, *Askari* led to 471 FAPLA/SWAPO deaths, with 25 South Africans killed and 94 wounded from all causes.

Operation *Askari* had multiple outcomes, the least permanent of which was the ineffective Luanda Accords under which the MPLA and the South Africans both undertook to avoid cross-border clashes. Further, the MPLA pledged to curtail PLAN activities whilst SWAPO was coaxed back to the negotiating table. Secondly, following *Askari*, SAAF aerial superiority began to wane in the face of sophisticated Soviet air defence systems (and the technicians to operate them) and Cuban MiG-23 fighters which began arriving in Angola in ever-increasing numbers. Lastly, the SADF concluded that warfare in Angola was becoming ever more conventional, and that should there ever be a need to operate there again, tanks as well as a full arsenal of conventional weapons would be needed. It was also the swansong of the Eland on external operations, as on several occasions during *Askari* it became clear that the Eland could not match the mobility of the Ratel; especially worrying given increasingly heavy FAPLA firepower.

Events in the Angolan Civil War, as well as a slipping ceasefire arrangement with SWAPO and FAPLA, meant that by 1986 the SADF would find itself again embroiled in Angola for a final, major battle.

1987: THE YEAR OF CONVENTIONAL WARFARE

Beginning in 1985 and throughout 1986, the MPLA began to put greater and greater pressure on UNITA. Well-organized and well-equipped offensives pushed Jonas Savimbi's organization out of its northern toeholds, whilst in 1986 a number of FAPLA brigades made serious inroads into UNITA territory in southern Angola. With Savimbi's headquarters at Jumba threatened, the SADF's ability to range deeply into Angola was compromised. In the face of a revived SWAPO insurgency, the SADF viewed this threat to UNITA in an exceptionally dim light. To use modern parlance, 'mission creep' had begun to set in, and for many South Africans, FAPLA and their Cuban advisors were as much of an enemy as SWAPO had been. At this key moment, P. W. Botha and the other hardliners of the National Party government decided once again to intervene directly in the Angolan Civil War, primarily to save Jonas Savimbi and secure his position once more.

The first instrument of this second intervention was 32 Battalion, a unit which by this stage had more than a decade's worth of experience in the semi-conventional bush warfare which had characterized the Border War. 32 Battalion was put to work planning a counter-attack on FAPLA, targeting their major logistics centre at Cuito Cuanavale using the full range of their mechanized forces: Ratels, Buffels, a fleet of mine-resistant Kwevoël logistics trucks, and the Valkiri, an improved 127mm multiple rocket launcher based on the Soviet BM-21 Katyusha (which had been nicknamed 'Stalin's Organ', and consequently the Valkiri was nicknamed 'Vorster's Organ').

Crucially, Operation *Alpha Centauri* would be the debut of a new South African howitzer, the G5. When Operation *Savannah* had painfully illustrated the obsolescence of the SADF's G1 and G2 guns, the army had undertaken a crash programme to acquire a modern howitzer capable of outshooting Cuban and Angolan 122mm, 130mm and 152mm guns. The rushed, indigenously designed G3 did not meet army requirements and never entered service, and in response the SADF acquired a small batch of 155mm guns manufactured by Israel's Soltam. These, designated the G4, were kept in reserve on the border and were seldom fired. The solution to the SADF's problem lay in the Canadian ballistics engineer Gerald Bull, from whom Armscor acquired the ballistics principles for the GC-45 and its Extended Range Full Bore ammunition. This gun design, improved on and manufactured by Lyttleton Engineering Works, was subsequently married to a gun carriage designed by Denel, and the 155mm G5 gun-howitzer entered pre-production in 1982.

The G5 gun

The G5 was in many ways one of the most advanced artillery pieces of its era. Its 45-calibre-long barrel, combined with a high-volume breech, meant that its muzzle velocity of 890m/s could launch a 46kg shell out to a range of some 30km at sea level. The design of the M1 family of rounds was also crucial. Unlike the World War II-era ammunition still in widespread NATO and Warsaw Pact service, the ERFB (Extended Range Full Bore) round was sleek and aerodynamically optimized. Combined with a base-bleed gas system pioneered in Sweden which minimized aerodynamic 'wobble' caused by tail drag, 'base-bleed' variants of the M1 round could hit targets 40km away. Its HE round was manufactured from high-strength steel which enabled it to carry a very potent 8.7kg warhead of TNT/RDX. This, coupled with its casing design, meant that it produced between 3,200 and 4,700 fragments upon detonation, which could be fused either as point-detonating, airburst or delay. G5s could also fire smoke, illumination and leaflet rounds, and whilst a base-ejection cluster round was being developed, it was never deployed to Angola.

Its range and firepower allowed the G5 to outreach hostile artillery and deliver the sort of interdictory strikes once only the domain of air forces. Coupled with a skilled forward controller, G5s were capable of reducing entire motorized columns or camps to ruins, easily destroying soft-skinned vehicles with air-bursting HE. Against harder targets like T-55s, point-impact-fused HE rounds were capable of destroying tracks and ripping apart optics with near-misses, whilst a direct hit to the thin roof armour via a plunging HE round was invariably not only fatal but resulted in a catastrophic secondary explosion which tore whole tanks apart. The G5 had in fact been designed with a secondary and/or self-defensive direct fire anti-tank role in mind and is still considered capable of disabling even modern composite-armoured main battle tanks. The G5's greatest flaw was that it was still carriage-mounted, and while capable of limited self-mobility, was still very much reliant on gun tractors and an entire family of support vehicles. However, since the beginning it had been considered an interim weapon. The SADF, taking note of NATO and Warsaw Pact developments, had always intended for the G5 gun to be mounted in a self-propelled vehicle which integrated much of the dispersed gun battery into one weapon system. This system, the G6, was already in the advanced stages of development as Operation *Alpha Centauri* got underway.

To the disappointment of 32 Battalion's troops, by the time Cuito

Among the early reinforcements for Operation *Moduler* were the eight 155mm G5 guns of Quebec Battery. The manifest deficiencies of the British World War II-vintage 5.5in (140mm) howitzer soon became apparent since it was comprehensively outranged by the Soviet 130mm M46 with its range of 27,000m. With some assistance from foreign parties, the South African-produced G5 was a revolutionary weapon capable of firing out to 40,000m when using base-bleed ammunition shells that weighed 47kg and contained 8.7kg of explosive. The South Africans now outranged the enemy by a significant margin and the G5 guns became a priority target to Angolan/Cuban fighter-bombers. Accordingly, Quebec Battery became adept at 'shoot-and-scoot' firing tactics and none was put out of action by enemy activity. During the Tumpo battles, the G5 proved devastating when investing the enemy airfield and air defence facility at Cuito Cuanavale, rendering them largely ineffective.

No account of armour during the Border War would be complete without mention of the 'Tiffies' or Artificers – the vehicle mechanics, gun fitters, radio repairers, and recovery specialists of the Technical Service Corps. Attached to formations at all levels, their unstinting efforts ensured that all vehicles, both armoured and soft-skin, attained maximum availability throughout the campaign. Here, a Withings 6x6 mine-protected recovery vehicle comes to the aid of an Eland-60.

Cuanavale was actually being attacked, it had been decided that UNITA's forces would take on all responsibility for ground action, with the SADF relegated to the role of artillery and reconnaissance support. After a number of delays, and with the eight G5s of Quebec Battery increasingly at risk of being spotted from the air, the UNITA attack finally materialized and the G5s went into action. The intensity of the bombardment stunned the defending FAPLA troops, and the G5s successively destroyed the FAPLA defensive lines around the town before proceeding to hit military infrastructure within it. Explosions could be heard from the ammunition dump within Cuito for the next three days, as UNITA troops managed to take and hold the town centre.

FAPLA, to their credit, managed to rally their forces and counter-attack, pushing UNITA from Cuito Cuanavale on 7 October 1987. Instead of scaling back their offensive, FAPLA poured more troops into the region and, as the dry season of 1987 came about, UNITA found themselves beset by the 16th, 21st, 25th, 47th and 59th FAPLA brigades – in all, some 12,000 troops. This, coupled with increasing FAPLA and Cuban dominance of the air thanks to a liberal supply of MiG-21 and MiG-23 strike planes from the Soviet Union, made it increasingly difficult for UNITA to hold on to its precarious position. UNITA was driven up to the River Lomba, and as the 21st Brigade threatened to cross in pursuit and defeat UNITA in detail, 32 Battalion and 61 Mech were ordered in to counter-attack and halt the FAPLA offensive. UNITA, meanwhile, was bolstered by a substantial CIA assistance package which included Stinger missiles. As Operation *Moduler* opened, another missile of an entirely different type was also about to make its combat debut.

The Ratel ZT-3

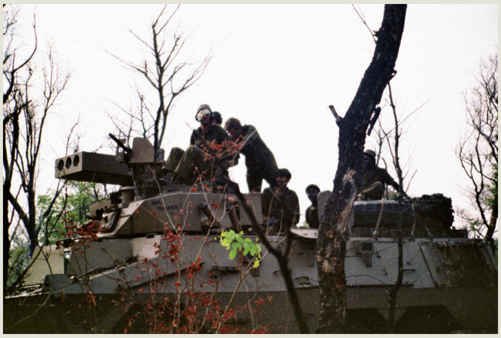
The ZT-3 missile was the result of considerable South African experience with anti-tank missiles in Angola. The cumbersome and awkward-to-use French ENTAC missile had been replaced with the far better Milan, whose SACLOS guidance system (semi-automatic command to line of sight) made it far easier to aim and guide effectively. The medium-weight weapon, ideal for mounting in light vehicles and for use by dedicated anti-tank infantry teams, had been acquired in bulk before the arms embargo had tightened again in 1977. It was well liked by the SADF and issued to 61 Mech and 32 Battalion's anti-tank elements but, like the ENTAC, had one major principal weakness – its guidance wires. Whilst functional and perfectly capable over the open plains of Europe or the Free State, in the dense bush of Angola guidance wires were always at risk of being severed even when relatively long lines of sight could be established.

Development of laser-guided missiles had been underway internationally for some time, with semi-active homing missiles like Hellfire reaching maturity. An alternative approach, that of beam-riding guidance, had been favoured by the Soviets and also by the Israelis, whose MAPATS missile was an ambitious upgrade of the TOW missile. Given the extensive military and technical co-operation between the South African and Israeli states (both isolated internationally and diplomatically by the late 1980s), the influence of MAPATS on the ZT-3 is clear. Both are 127mm in calibre and feature an overall resemblance to later generations of TOW missile. The ZT-3 was designed to serve as a heavy-weight tank killer, and belatedly fulfilled SADF requirements for armament for a dedicated tank-destroying version of the Ratel. Designed and manufactured by Kentron, the missile had a substantial range advantage over the standard TOW (5,000m, against TOW's 3,750m), thanks to its freedom from guidance wires, and more than doubled that of Milan. What's more, it could be fired through somewhat dense bush or over water without risk of having a wire severed. Accurate and potent, the 700mm of RHA (rolled homogenous armour) penetration achieved by early versions was more than adequate for dealing with the all-steel armour of the T-55 and T-62, although like all ATGM systems it has a substantial time-to-kill. ZT-3 Ratels were equipped with a three-missile launcher mounted above a further-modified Eland turret which integrated the missile's optics and guidance. Storage of missiles reduced space in the rear for infantry, and reloading was done manually via the roof hatches integral to the Ratel.

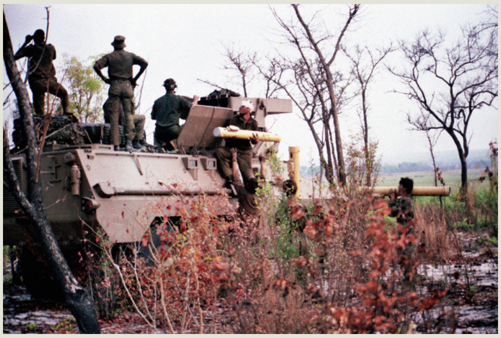
61 Mech, in concert with 32 Battalion's anti-tank squadron, went into battle with 21 Brigade on 9 September 1987, with 32 Battalion equipped with pre-production ZT-3s in addition to its Ratel-90s. The South Africans drew first blood when they caught a platoon of FAPLA T-55s at the edge of a wide open *shona* (floodplain). Striking from well-concealed positions 2km away, the ZT-3s under Major Hannes Nortmann opened fire. Of the ten temperamental pre-production missiles fired, five scored hits, destroying the entire FAPLA platoon. Tough, close-in fighting followed as the 47th Brigade and a FAPLA tactical tank platoon joined in the attack. The South Africans lost eight men in the ensuing fighting, seven of them in a single 32 Battalion Ratel-90 which had become bogged down in a *shona* and was destroyed by a T-55 at point-blank range. In return, the Ratel-90s destroyed a further six T-55s and the entire fight cost FAPLA 328 dead. 61 Mech then went on the offensive, attacking 47th Brigade as it was wedged into a bend of the River Lomba, attempting to cross and link up with the 59th Brigade.

The attack was preceded by a massive bombardment by G5s, Valkiri multiple rocket launchers and 120mm mortars, and in the ensuing battle 61 Mech systematically destroyed the 47th, trapped in the open. Ratel-90s hit exposed T-55s, before turning their guns on BTRs and the handful of BMP-1s which accompanied the 47th Brigade, as air-bursting artillery exploded over the kill zone. Exact FAPLA casualties were difficult to determine but were in excess of 250, and 47th Brigade

It cannot be overstated how difficult much of the terrain in Angola was for AFVs of all types, including the 56-ton Olifants. The dense bush and thick trees were an impediment to any movement. Quite apart from the dead branches and venomous snakes that could fall onto turret tops, the bush also hid an enemy expansively provided with RPGs and other anti-tank weapons. None did it better than the Olifant Mark 1A Armoured Recovery Vehicle (ARV), of which two were attached to each tank squadron in Angola. When the bush became particularly difficult, the Olifant ARV was placed in the van of the advance to clear a path for the following vehicles, although this was an extravagant use for such an invaluable squadron asset.

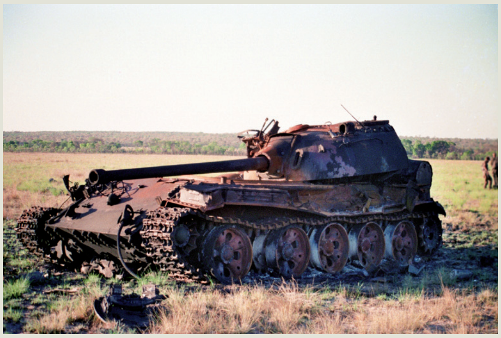


The crew of the Ratel ZT-3 prepare IRON MAIDEN for its first anti-tank engagement on 10 September 1987.



After the first salvo of missiles failed, the crew reload the missile launcher for the next engagement.

FAPLA tanks burn in the distance after the successful engagement by Major Hannes Nortmann.



This T-54 was Nortmann's second victim, its turret was displaced and landed on the engine decks.

E

1: RATEL ZT-3, ANTI-TANK SQUADRON, 32 BATTALION, ATTACHED 61 MECHANIZED BATTALION GROUP, OPERATION *MODULER*, SEPTEMBER 1987

The most sophisticated variant of the Ratel was the Anti-Tank Guided Weapon (ATGW) ZT-3 that was configured to mount a special turret with a launcher for three 127mm missiles. Four pre-production models were deployed in time for Operation *Moduler* and first saw action on the banks of the Lomba River on 10 September 1987. Attached to the Anti-Tank Squadron of 32 Battalion under the command of Major Hannes Nortmann, the latter commandeered one of the ZT-3s for their first ever engagement against a group of advancing T-54s. On firing, the first missile went rogue, pulling up vertically after just 200m; the second did much the same while the third did not fire at all. By now the supporting Ratel-90s were perforce obliged to engage the approaching tanks, but at maximum range where the 90mm HEAT round was largely ineffective. One of the tanks was struck by three 90mm rounds; it stopped, only to start forward again. Fortunately, this gave time for the ZT-3 crew to reload the missile launcher. Nortmann fired his fourth missile which struck the T-54 and blew its turret some 25m to the side. The fifth missile fell short of its target while the sixth struck home destroying another tank. Reloading once more, a further T-54 was hit by two missiles and detonated in spectacular fashion. Another tank was engaged by a further missile but during its time of flight an unfortunate FAPLA soldier stood up and received the full force of the speeding missile which exploded on contact. The remaining tanks and their supporting infantry retreated in disarray.

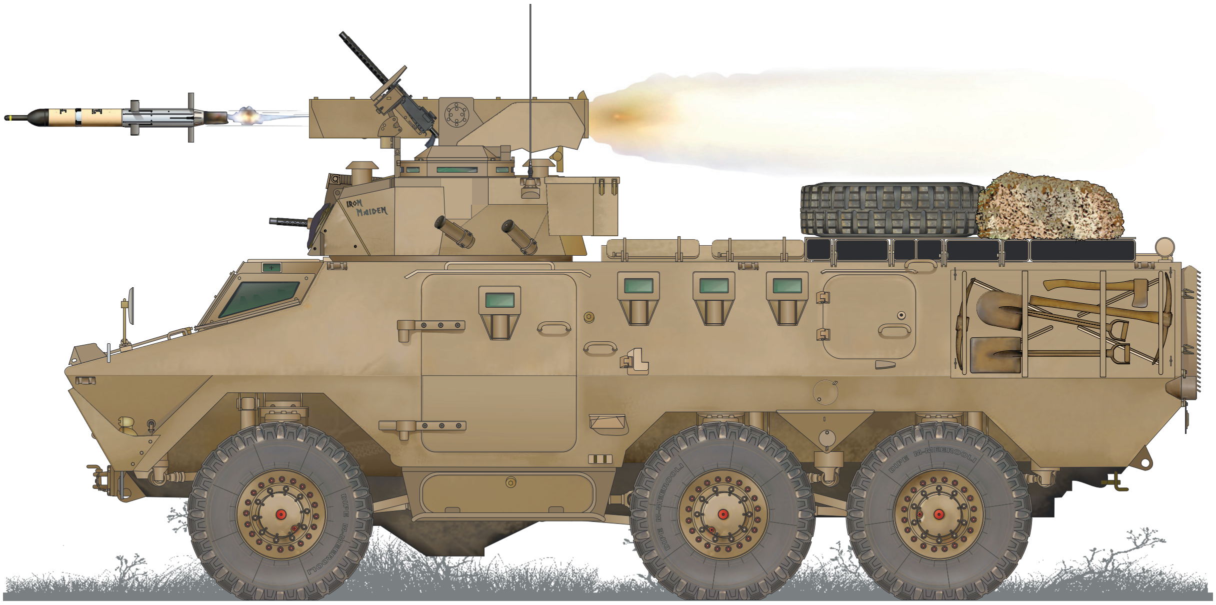
The ZT-3 is finished in nutria sand colour and on the side of the turret the crew has named their vehicle IRON MAIDEN in black. Subsequent Ratel ZT-3s had a fetching three-colour camouflage scheme of pale sand, brown and green. One of the original Ratel ZT-3s used in this action is preserved at the School of Armour Museum in Bloemfontein.

2: OLIFANT ARV MK 1A, E SQUADRON, SCHOOL OF ARMOUR, OPERATION *HOOPER*, ANGOLA, JANUARY 1988

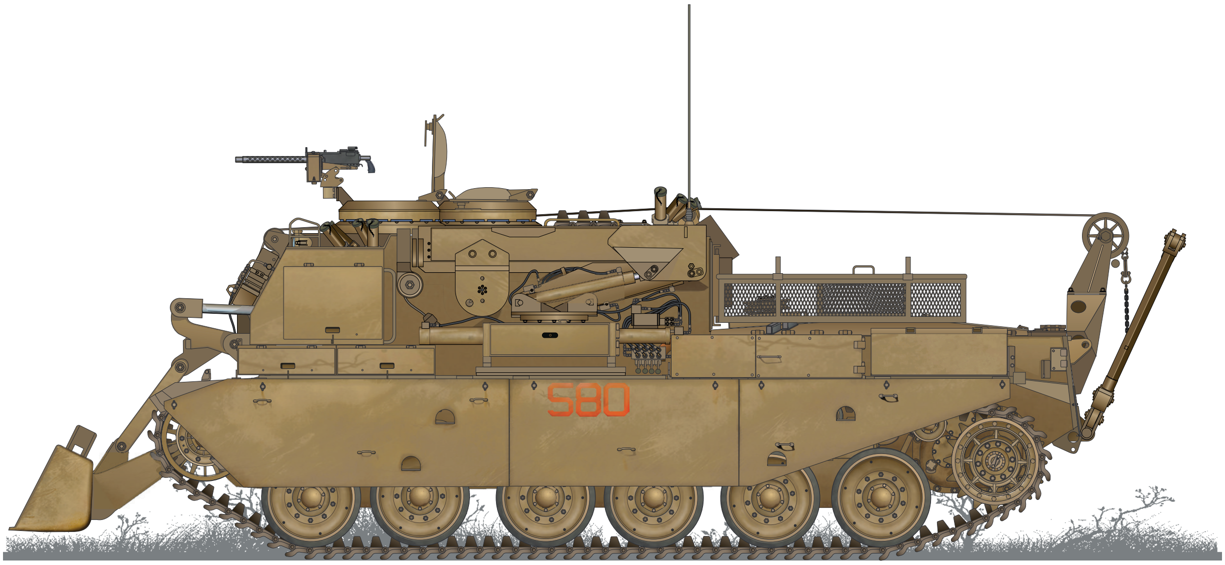
'Vyf Agt Delta Kom!' – 'Five Eight Delta Come!' was the radio transmission often heard during operations as an Olifant or any other vehicle in the task force sought assistance for repair or recovery on the battlefield. The Armoured Recovery Vehicle or ARV was the most important variant of any main battle tank. One was commonly attached to each tank squadron, but in Angola the complement was increased to two because of the arduous operating conditions and difficult terrain. The Olifant ARV Mk 1A was a highly effective vehicle with a front-mounted dozer blade for digging and to act as a ground anchor during winching operations. The ARV also has a side-mounted crane for lifting heavy objects, up to and including a complete Olifant powerpack. Given the dense bush encountered in Angola, the ARV often led an armoured column, with its dozer blade clearing the way for following vehicles.

When the first tank squadron deployed to Angola in October 1987, it was accompanied by the first ARVs off the production line. Five Eight Delta has the registration number R122688 and its four-man crew were Warrant Officer Class1 Daan Robettze, Staff Sergeant Alwyn Hattingh, Staff Sergeant Peet Human and Staff Sergeant Pa Venter; all highly experienced 'tiffies' as the repair personnel of the Technical Services Corps were known. If possible the crew was made up of 'tiffies' with different but complementary skills, so one might be a recovery mechanic; another a gun fitter; a third an electronics expert and the fourth a vehicle mechanic, so that all aspects of tank repair were covered. After a gruelling day in the field accompanying the tank squadron, the tiffies frequently worked through the night in order to keep all the tanks in running order. It is to their lasting credit that invariably all the tanks were ready for battle on the following day.

1


IRON MAIDEN

2



OPPOSITE
As Operation *Moduler* progressed it became apparent that the surfeit of Angolan/Cuban armour was stretching the capabilities of the Elands and Ratel-90s, so it was decided to deploy a tank squadron to Angola, reputedly at the express order of the South African Prime Minister, P. W. Botha. Having had the South African Armoured Corps Centurions upgraded at considerable expense to the standard of the Israeli Shot Cal and renaming them the Olifant, he demanded to know why they were not used in Angola. The South African high command immediately deployed E Squadron of the School of Armour to reinforce Operation *Moduler*, arriving in October 1987. This Olifant Mk 1 is undergoing training prior to deployment to the 'border': the euphemism often employed to denote operations inside Angola. The markings on the turret rear indicate that it belongs to E Squadron, with the insignia of 61 Mechanized Battalion beside the call sign.

had now lost 18 tanks, 16 BTRs, three BMPs and some 120 trucks. It had ceased to exist as a fighting force, and the FAPLA offensive had been halted.

But the SADF was not done and now chose to go onto the offensive. A further combat group was called up, composed of regulars from 4 South African Infantry Battalion, and attached to this group was Echo Squadron, Tank Wing of the South African School of Armour, with 13 Olifant Mk 1A main battle tanks.

The Olifant

By 1987 the tank had undergone a drastic revival in SADF service. Largely sidelined by the doctrinal shift in the late 1960s towards wheeled vehicles, half of the original South African Centurion fleet had been sold to Switzerland in 1965. But in the light of operational experience in *Savannah*, the SADF had reversed its position and embarked on a modernization programme for its Centurion Mk 5s, still armed with their original 20-pdr guns in 1976. Progressing from the earlier, interim Skokiaan (Moonshine) and Semel (Bran) projects, the resulting Olifant (Elephant) Mk 1A was a substantial rebuild and mechanical upgrade of the original Centurion by the Olifant Manufacturing Company of Benoni (in Johannesburg's East Rand) and by the army's 61 Base Workshop. It was re-engined with a 29-litre Continental turbo-diesel (sourced from Israel) which produced some 750hp and 2,332 Nm of torque. Maintenance was considerably simplified by rail-mounting the engine as an integrated 'power-pack', and overall its mobility was substantially improved over that of the base Centurion.

The Olifant was also upgunned, with the 84mm 20-pdr replaced by the 105mm L7. Locally manufactured as the GT-3B by Lyttleton Engineering Works (LEW), South Africa received substantial Israeli aid in its development, in addition to purchasing substantial stocks of L52 armour-piercing discarding sabot (APDS), M456 HEAT, and by 1987, M111 armour-piercing fin-stabilized discarding-sabot (APFSDS) tank rounds. The M456 could penetrate some 420mm of RHA at any range, whilst the first-generation long-rod tungsten-alloy penetrator of the M111 punched through some 390mm of RHA at the muzzle. Either could easily overpenetrate the T-55 and T-62, especially at the very short ranges of bush warfare. Both of the 105mm anti-tank rounds were found to be far more lethal in that role than the 90mm of the Ratel and Eland, thanks to their far superior behind-armour effects. Fire control was enormously improved, with the original 6x stadia sight

This dramatic action shot shows a Ratel-90 engaging the enemy during Operation *Moduler* in September 1987. In confused fighting during late September, the Combat Groups drawn from 32 Battalion, 61 Mech and 101 Battalion attacked the FAPLA 47 Brigade, with the Ratel-90s providing direct fire support and the anti-armour capability. By 3 October, 47 Brigade was comprehensively degraded with the loss of 18 tanks and five other AFVs, almost exclusively to the Ratel-90, and much other valuable equipment. Nevertheless, it was realized that the increasing number of Angolan/Cuban T-54/-55s on the battlefield required something heavier than the 90mm gun of the Eland-90 and Ratel-90. The call went out for the Olifant.

replaced with an Eloptro 8x gunner's day sight co-mounted with a laser range finder. Data from the rangefinder was automatically fed into the Olifant's split range drum, which then automatically applied elevation to the gun. Taking a myriad of other ballistics data into account, the system could produce exceptional accuracy and APFSDS groupings of 50cm x 50cm at 2,000m were achievable. Capable of achieving first-round hits at 2,000m-plus, the system was somewhat overkill at the short ranges of the Angolan bush but would have been an enormous asset if fighting ever crossed into the open expanses of northern Namibia.

The Olifant retained the original armour of the Centurion (152mm RHA on the mantlet and 76mm inclined at 60 degrees for the glacis), and was protected all round against the dreaded 23mm anti-aircraft gun that had so plagued the Ratel crews. The SADF freely admitted that the Olifant was vulnerable to the T-55's 100mm gun, to say nothing of the T-62's APFSDS-firing 115mm, as well as RPG-7s and nearly any Soviet ATGM system. Work continued on the development of improved Olifant variants and a next-generation tank to counter a feared deployment of T-72s to Angola. This threat never materialized and the Olifant primarily went into battle against standard FAPLA T-55s.

The 1987 campaign

Operation *Moduler* transitioned from a defensive phase against the 21st and 47th FAPLA brigades to a concerted counter-attack which began on 9 November. South African forces now included three UNITA battalions, 4SAI, 61 Mech, 32 Battalion, a tank squadron, two batteries of G5 guns, two batteries of Valkiri multiple rocket launchers and a new arrival on the Angolan battlefield: three pre-production G6s. The G6 featured the G5's gun mounted in a turret built by LIW, mated to a six-wheeled hull built by OMC, and like the Olifant was an exceptional 'bush-breaker'. The G6s would operate as an independent battery and showed remarkable self-sufficiency in the bush as the operation against FAPLA's 16th Brigade at the source of the Chambinga river got underway. The attack was preceded by heavy artillery bombardment, and over the next three days repeated South African attacks smashed the 16th Brigade and units supporting it to the south. In preparation for the fighting, FAPLA had constructed a number of sand berms and fighting pits for its heavy armour in classic Soviet defensive tactics.

FAPLA's tactical awareness and cohesion, however, was again lacking in comparison to the South Africans and, when Olifant tanks of E Squadron at the

There is a troop of three tanks in this photograph which graphically shows the problems of command and control during an attack in such difficult terrain, let alone identifying enemy troops or AFVs hidden in the undergrowth. Accordingly, engagement ranges were rarely above 150m and often below 50m. However, the sheer sensory overload of a squadron of Olifants crashing through the bush with their turbocharged Continental engines screaming at full throttle was often sufficient incentive for FAPLA soldiers to withdraw.

spear tip of the SADF attack encountered T-55s on 9 November, Lieutenant Hein Fourie destroyed the first of several to fall to the Olifants. The SADF tanks proved especially lethal in the fighting conducted at what was sometimes 50m or less – extremely close ranges for tank warfare. SADF tankers preferred having HEAT rounds loaded for first contact, whose blast was more visible through thick vegetation than the flash and sparks of an APFSDS impact. The instant-fused HEAT rounds in turn could detonate prematurely when fired through thick branches or defensive sand berms and Olifant crews would then switch to APFSDS rounds to penetrate these, with the round retaining enough

F

1: OLIFANT MK 1A, E SQUADRON, SCHOOL OF ARMOUR, OPERATION *HOOPER*, ANGOLA, FEBRUARY 1988

For many years the use of tanks in Angola was discounted since the war was deemed to be a classic counter-insurgency campaign, and the terrain in eastern Angola was ill suited to heavy AFVs. But the increasing use of T-54/-55 main battle tanks by the enemy demanded a wholesale reappraisal, as the 90mm main armament of the Eland-90 and Ratel-90 was not fully effective against such heavy armour. In October 1987, E Squadron of the School of Armour was deployed to Angola from Bloemfontein to counter the Cuban/FAPLA September offensive against UNITA. It first saw action during Operation *Moduler*.

E Squadron was the only operational tank squadron at the time, while F Squadron acted as the training squadron and to maintain the manpower of E Squadron at full complement. On 8 December, F Squadron replaced E, taking over the latter's Olifants in the field and spending the first few days servicing and replenishing the battle-weary tanks.

Commanded by Major Tim Rudman, F Squadron assumed the identity of E Squadron since the task force was familiar with the tank squadron's call signs in battle. It also meant that it was unnecessary to repaint the call sign markings on the tanks. Thus 'Five' in Five One Bravo indicates E Squadron as the fifth letter in the alphabet; One being One Troop and Bravo the third tank in the troop. Five One Bravo was commanded by Trooper J. Pretorius (usually the job of a junior NCO) with Trooper J. Wessels as gunner; Trooper A. van der Linde as loader and Trooper S. Mikula as driver. The call sign Five One Bravo appears on the rear turret bin applied in white tape and a red silhouette of a tank. The latter is repeated on the rear hull plate beside the registration number and above the illuminated convoy distance marker. At the end of the barrel is a thin red ring that indicates that 51B has destroyed a soft-skin vehicle whereas a thicker ring denoted the destruction of a tank or AFV.

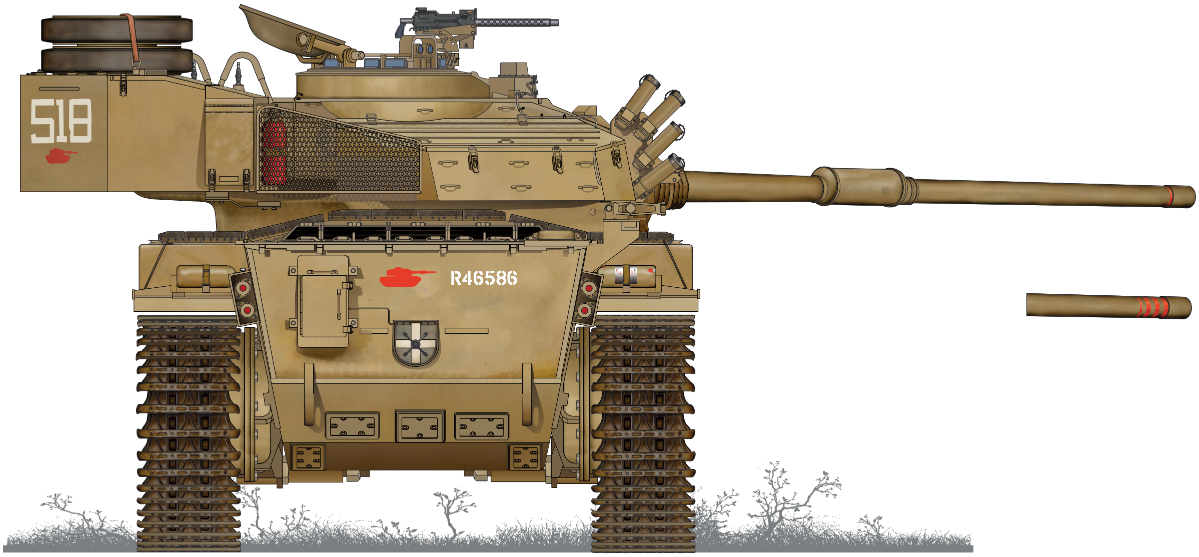
2: OLIFANT MK 1, E SQUADRON, SCHOOL OF ARMOUR, OPERATION *EXCITE*, ANGOLA, JUNE 1988

At any one time there were no more than two tank squadrons, both Permanent Force and Citizen Force, deployed in Angola: a total of just 26 tanks against hundreds used by the enemy. Each squadron comprised three troops of three tanks; a Headquarters troop of two tanks, Zero Alpha and Zero Bravo – one for the squadron commander and one for his second-in-command – as well as two spare tanks. With its call sign of Sierra Two, this tank is the second spare tank, which often carried a mineroller attachment to lead the squadron through the minefields that remained the principal threat to the tanks.

All the tanks in E Squadron at this time were given names beginning with the letter E, and Sierra Two is called EXECUTIONER. It is also adorned with axes to reinforce its name, but the large call sign S2 on the rear of the turret bin was later obscured with mud to eliminate an obvious aiming point to the enemy, as were registration numbers for security reasons. The crew comprised Corporal 'Blokkies' Pretorius as commander; Corporal William Surmon as gunner; Trooper 'Swanies' Swanepoel as loader/operator and Trooper Brophy as driver.

EXECUTIONER is depicted during the final phase of Operation *Excite* in late June 1988. E Squadron came under the operational control of 61 Mechanized Infantry Battalion Group during the final tank battle of the war near Techipa just north of the border of South West Africa. On the morning of 27 June, 32 Battalion and 61 Mech, the two SADF stalwarts of the Border War, engaged two advancing columns of Cuban/FAPLA armour with tank fire and G5 artillery. The enemy was stopped in its tracks with Five Three Bravo of E Squadron destroying the final AFV target of the war – a BTR-60. It was arguably the last tank round fired in anger during the Cold War.

1



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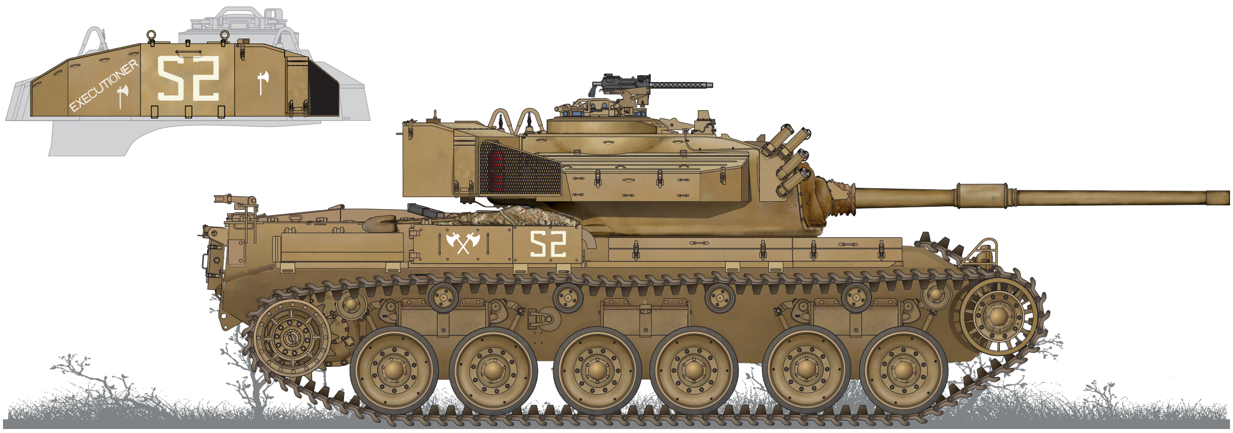

EXECUTIONER
52
52

kinetic energy afterwards to still pierce the frontal glacis or turret of the T-55.

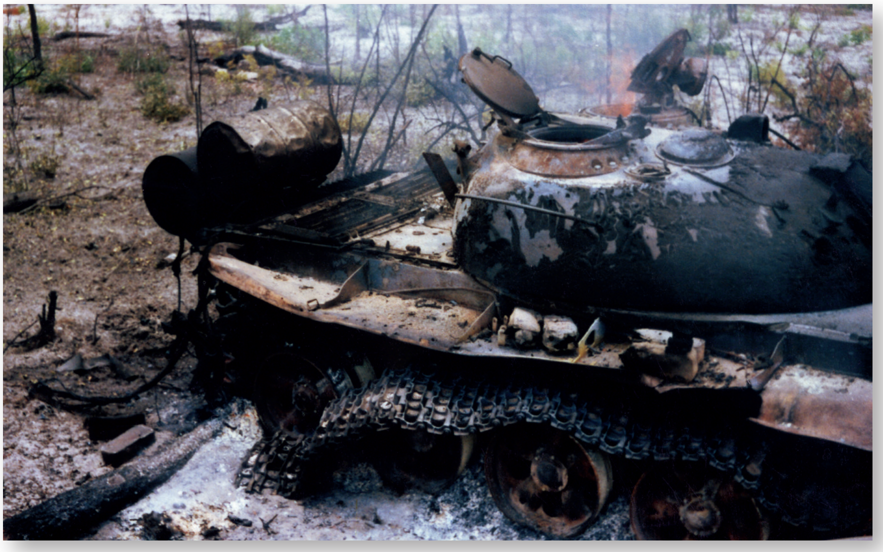
The driver of Five One Bravo, Trooper Sean Mikula, performs maintenance on his tank. It was realized that the Olifant squadron would require extensive and continuous logistical support to remain effective in the field. Yet, it was the dedication of the individual tank crews and the expertise of the 'Tiffies' that allowed the Olifants to be so effective during the later stages of the Border War.

Together with Ratel-90s, the Olifant tanks repeatedly broke the 16th Brigade's positions, despite the presence of heavy FAPLA armour. BM-21's were used for direct fire, and either a BM-21 rocket or 100mm tank round tore the idler off an Olifant (short-tracked, it continued to fight and was repaired later). FAPLA and its Cuban advisors counter-attacked hard in places, with a Ratel-20 formation being caught in the open by a formation of T-55s. A Ratel gunner opened up with a hail of 20mm AP and HE, buying time for the rest of the formation to disperse before the Ratel was destroyed. Ratel-90s and Olifant intervened and the T-55s were destroyed, but the fighting was very heavy at times, with intense FAPLA artillery bombardment taking a heavy toll especially on UNITA's exposed infantry before SADF counter-bombardment could silence FAPLA's guns. The battle at Chambinga cost FAPLA 525 killed, 33 tanks, 15 BTRs and 111 trucks, whilst the SADF suffered 17 dead and 41 wounded, with three Ratels and a number of support vehicles lost. The 16th Brigade's remnants fled west towards Cuito Cuanavale, and with the Chambinga source taken, *Moduler* was beginning to wind down. South African G5s were now within range of Cuito Cuanavale again, and intermittently bombarded the town as the SADF and UNITA contemplated their next move.

The campaign ahead was to be increasingly difficult. SADF commanders on the ground had strongly urged a flanking attack on Cuito Cuanavale from the west to take the town and cut off FAPLA's logistics lines. This would permit FAPLA's forces in the south to be broken. This plan was rejected, partly out of a desire to avoid calling up the South African reservists necessary for such a large operation; and partly to prevent an escalation of the conflict by drawing in ever-larger Cuban intervention forces.

Instead, Operation *Hooper* was to be purely a clearing operation of the Chambinga highlands to the east of the River Tumpo, with the intention of destroying FAPLA's 21st and 59th Brigades. SADF supply lines had become very long, and maintaining the Olifant tanks in particular was proving difficult in tough Angolan conditions. The Cuban and Angolan air presence was increasingly disruptive of SADF operations, and whilst there had been only a handful of effective airstrikes (a pair of Ratels being destroyed on 15 September with one South African fatality), extensive efforts to avoid hostile airpower had restricted mass movement to night time. FAPLA's troops were being resupplied and re-equipped and would be compressed into an ever-denser defensive box, having had time to prepare substantial minefields and bring up massive artillery support. Foxtrot Squadron of the School of Armour under Major Tim Rudman, replaced Echo Squadron (being redesignated Echo Squadron as they did), whilst a second Olifant squadron was added to the order of

On deployment to Angola, E Squadron School of Armour, was attached to 4 SAI (South African Infantry Battalion – pronounced 'Sigh') and assigned to Combat Group Charlie for the attack against the FAPLA 16 Brigade on 9 November 1987. Here, the Olifants of E Squadron undergo infantry-tank cooperation with troops of 4 SAI and UNITA.



The tanks of E Squadron entered battle on 9 November 1987 near the source of the Chambinga River against the entrenched FAPLA 16 Brigade. At 0800hrs, the Olifants of E Squadron and the Ratels of A Company 4 SAI, struck 16 Brigade and, at 0809hrs, Lt Hein Fourie engaged and destroyed a T-55. At 0817hrs another tank was knocked out by Lt Abrie Strauss. On this day, 16 Brigade lost ten T-54/-55s with three captured as well as two BM-21 multiple rocket launchers, numerous towed artillery guns and 30 trucks. South African losses were one Ratel destroyed and another damaged, while an Olifant was struck in the idler wheel but was soon repaired. Here, a 16 Brigade T-54 burns after being struck by 105mm APFSDS-T and HEAT projectiles.

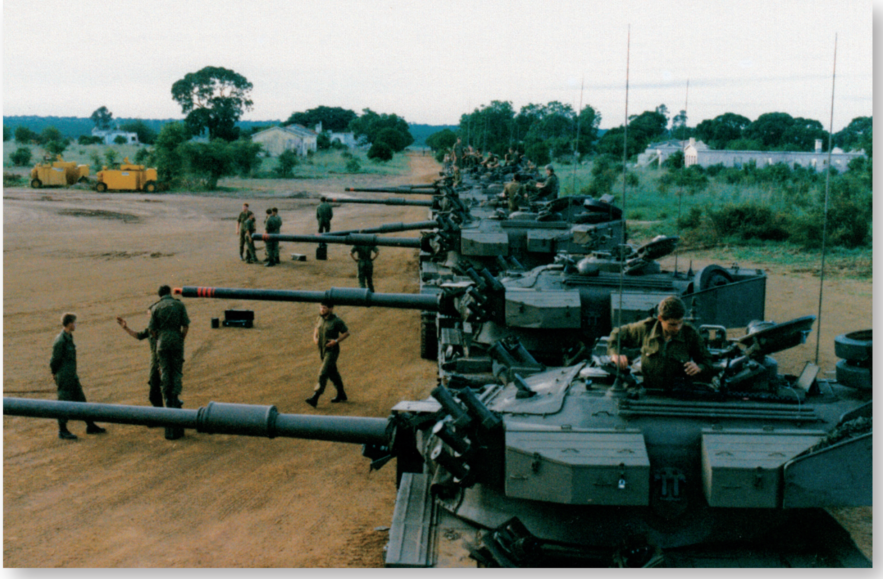
battle, manned by Citizen Force reservists from the Pretoria Regiment and later Regiment Molopo.

Operation *Hooper* finally rumbled into action on 2 January 1988. It required two attacks to dislodge the 21st Brigade from its position astride the River Cuatir, the first by a purely UNITA force. A joint SADF/UNITA assault on the 14th drove off the 59th Brigade, before a Cuban-led counter-attack charged the South African positions. One Olifant was damaged and a Ratel destroyed, but the counter-attack, for all its courage, was destroyed in place with all six T-55s being knocked out. The attacks on the 21st and 59th Brigades had cost FAPLA 21 tanks and some 480 killed, against four SADF deaths. SADF attempts to follow up were met with a hail of artillery and rocket fire, and FAPLA's fresh 25th Brigade successfully eluded a decisive engagement by withdrawing to within a heavily mined area on the edge of the River Tumpo. The 'Tumpo Triangle' was covered by no fewer than 60 FAPLA and Cuban guns, as well as BM-21 rocket launchers firing nearly horizontally from the high ground to the river's west. In one bombardment, an Olifant was struck on its front glacis by a plunging 122mm rocket and its driver was killed before he could close his hatch (the Olifant survived and was returned to service). Two efforts to push through the Triangle were repulsed by heavy artillery fire which the SADF could not avoid thanks to densely laid minefields and, after the second attack on 25 February, Operation *Hooper* was called off.

South African personnel troubles were now becoming seriously apparent, with some Permanent Force soldiers having been in action for several months and with national service conscripts being cycled out, having met their terms of service. With members of the reservist 82nd Citizen Force Brigade now taking the lead, the South African offensive was

Since the enemy enjoyed air superiority, tank crews became adept at camouflage. The radio command 'Victor Victor 10 K' indicated that aircraft were approaching from 10km away, at which tanks would find cover in the trees and switch off their engines to prevent noticeable diesel exhaust. After the tanks' success during *Moduler*, a second squadron was deployed, but due to a lack of manpower in the regular army it fell to the Citizen Force reservists to step into the breach. The troops of the Pretoria, Molopo and President Steyn Regiments were returned to duty and not found wanting in the final battles of the Border War.

On 8 December 1987, F Squadron School of Armour, under the command of Major Tim Rudman, took over the Olifants from E Squadron and continued a programme of maintenance and refurbishment to bring the battle-weary tanks back to full operational performance. Since F Squadron was the training squadron at the School of Armour at Bloemfontein it assumed the title of E Squadron once in Angola. Here, the tanks of F Squadron boresight their 105mm guns before the next battles during Operation *Hooper*, the continuation of Operation *Moduler*. The red rings on the end of the 105mm gun barrels indicate vehicle kills, with the thick ones denoting AFVs and the thin ones soft-skin vehicles.



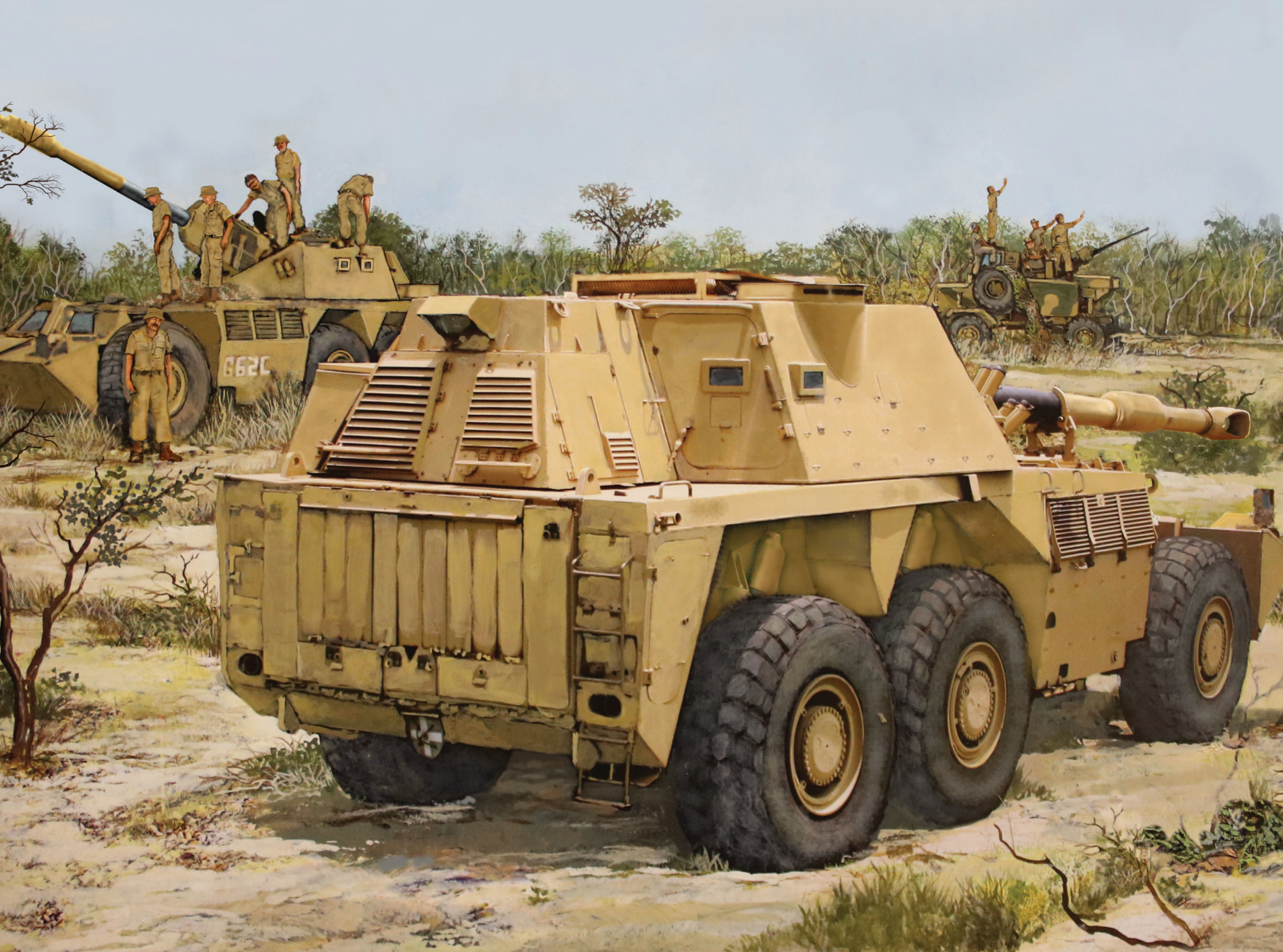
re-launched as Operation *Packer*. Problems with logistics had meant that only two mine rollers were available for the entire South African tank force, which took the lead role in the assault. Army engineers accompanied the assault force, and blasted lanes through the minefields with 'Plofadder' mine-clearing line charges. The assault started well but predictably began bogging down in the face of heavy artillery bombardment. UNITA infantry riding on the backs of the Olifants were picked off by machine gun and cannon fire, and soon two Olifants became immobilized by mines with a third throwing its track. Despite a brave and determined effort to recover them, the assault was called off with many SADF troops expecting to return.

G

G6 155MM SELF-PROPELLED GUN HOWITZER, J BATTERY, 20 ARTILLERY REGIMENT, OPERATION *MODULER* , ANGOLA, NOVEMBER 1987

Project Zenula was the codename for the design of a self-propelled version of the highly successful 45-calibre 155mm G5 howitzer. Developed by Armscor and Lyttelton Engineering Works, a 6x6 wheeled configuration was chosen for greater strategic mobility across the vast distances of the region as well as being cheaper than a tracked vehicle. The first G6 prototype appeared in 1981 and four engineering development models were completed in 1987 for final troop trials. In a bold decision, these four vehicles together with a logistics package were deployed to Angola in October 1987 in support of Operation *Moduler*. En route the powerpack of one G6 suffered a catastrophic failure so only three arrived at the front to support 4 SAI Battalion Group and invest the airfield at Cuito Carnavale. This they did with considerable success, forcing enemy aircraft to operate out of Menongue.

Weighing 43 tons, the G6 has a crew of six and carries a ready supply of 64 complete rounds of ammunition. With a maximum range of 39km on Charge 3, the 155mm howitzers effectively outranged the Soviet-supplied enemy artillery so were not readily liable to counter-bombardment fire. But as the enemy enjoyed air superiority the guns were vulnerable to air attack, although enemy bombing was usually inaccurate. Nevertheless, since the G6s were so valuable it was customary to keep them on the move and to provide anti-aircraft protection such as here, with the Ystervark 20mm self-propelled gun. Meaning 'Porcupine' in Afrikaans, the Ystervark with its GAI-CO1 20mm cannon is based on the chassis of the Bulldog – the successor to the Buffel. This Ystervark was assigned to 10 Anti-Aircraft Artillery Regiment. The G6 Rhinos deployed to Angola did not carry any markings and were finished in the basic nutria sand brown colour.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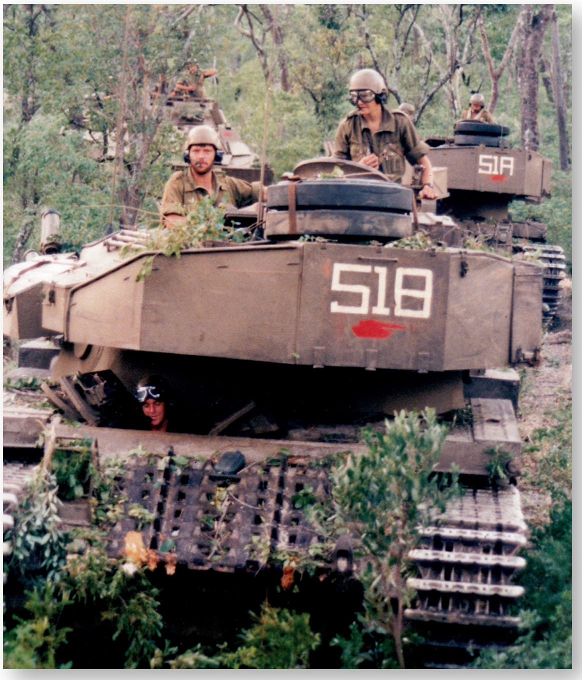

The Olifants of 1 Troop E Squadron advance through the bush as they proceed to contact during Operation *Hooper* in February 1988: the risk of damage to the 105mm gun barrel and the stabilizer equipment from trees and vines required the turrets to be traversed in such terrain. The call sign Five One Bravo indicates the Troop Corporal's tank of 1 Troop and shows the frontal aspect of the Olifant depicted in Plate F1. This Olifant Mk 1A has spare track links attached to the glacis plate as generations of tank crews have done for extra protection and ready spares in case of mine damage. Note the track guards have been cut back to prevent the build-up of vegetation beneath them. To the rear is Five One Alpha, the Olifant of Staff Sergeant 'Spikkels' Terreblanche: a legendary South African Armoured Corps NCO who never believed that one round was sufficient against any target when six would achieve a more conclusive result.

Pretoria, however, had concluded that their objectives – namely the salvation of UNITA – had been accomplished and *Packer* was called off. When it became apparent that the Olifant tanks were not going to be recovered, a heavy artillery bombardment was called down on them in an effort to deny them to the enemy. The two Olifants that bogged down in the minefield remain there to this day, with the third de-tracked Olifant having been captured mostly intact by FAPLA. Its turret was removed and reportedly shipped to the Soviet Union, with its hull remaining in place at Menongue airport.

The SADF withdrew under Operation *Displace* starting on 23 March 1988, and the battle of Cuito Cuanavale, as it became known, was a widely celebrated propaganda victory for the Cubans and FAPLA despite their huge losses and despite the fact that the town itself had never been an SADF objective. Events rapidly developed from there, when ironically and despite the efforts by the South Africans to avoid provoking exactly such an event, Operations *Moduler*, *Hooper* and *Packer* prompted the deployment of a second major Cuban intervention force. The Cuban 50th Division and a further force of some 40,000 Angolans opened a second front at Lubango, far to the west of Cuito Cuanavale. Olifant tanks were involved in a series of bloody and inconclusive battles in the west, which prompted the Cubans to bomb the Calueque hydro-electric dam in a show of force which killed 23 SADF servicemen. The SADF responded by raising a division-sized force to oppose a push on Namibia itself, and it has been suggested that the threat of Cuban chemical weapons was responded to by the South Africans with the promise of nuclear retaliation. Faced with a military stalemate and the prospect of fighting a major war thousands of kilometres away from either of their countries, the South Africans and Cubans allowed tensions to cool and, in late 1988, the Border War was concluded with New York Accords signed by South Africa, Cuba and Angola.

CONCLUSION

The Border War was a major proxy conflict in the broader context of the Cold War which featured at times thousands of combatants and the largest conventional battles on African soil since El Alamein. Prompted by a host of challenges (the landmine; enormous Soviet and Cuban support for the MPLA; the international arms embargo), perhaps the most impressive aspect of the conflict was the speed with which the South African military modernized both its doctrine and equipment. Ambitious programmes to develop wheeled armoured vehicles and some of the world's first mine-protected vehicles had yielded results by the time of Operation *Savannah*, and yet the South African intervention in the Angolan Civil War also illustrated to the South Africans shortcomings in their ability to fight conventional battles. In the ten years since the implementation of the UN arms embargo in 1977, South African progress from World War II-vintage weaponry to the cutting edge was no less than astonishing: artillery from the 25-pdr to the G6; ATGMs from ENTAC to ZT-3; and tanks from Centurions to the composite-armoured variants of the Olifant were all developed during this time. This evolution is telling, and illustrates vividly the strengths of the SADF, then engaged in a chapter of the Cold War struggle in a fiercely contested corner of Africa.

The Border War of 1975 to 1989 was the culmination of the many proxy wars of the Cold War fought between the United States and the Soviet Union. Such an ideological conflict was obviously lost on the unfortunate Angolans impressed into the warring factions, be they FAPLA, SWAPO or UNITA. They fought and died for an abstract cause they did not understand against a determined enemy comprising mainly white conscripts from a regime despised by the international community. But when called to the colours these same young men proved to be formidable warriors, much as their forebears the Boers, and were able, with never more than 5,000 troops in Angola, to contain a Cuban force of 60,000 and thousands of FAPLA troops. Right or wrong, it was the individual soldier ensconced in the bowels of an Olifant, or the 'Troepie' on the ground with just his R-1 rifle, that held the line until a political solution was reached and South West Africa became Namibia, and the Republic of South Africa became a democratic multi-cultural nation.

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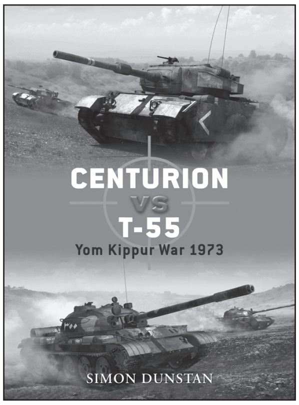

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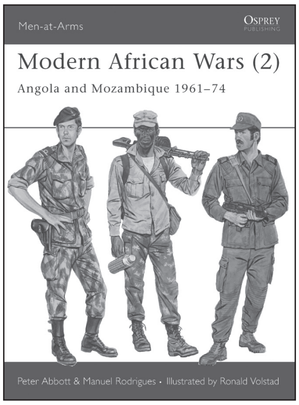

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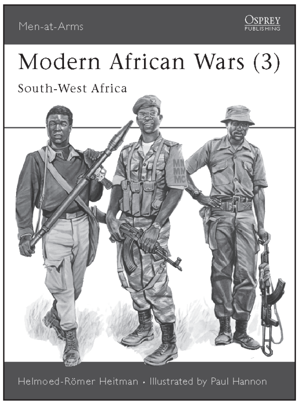

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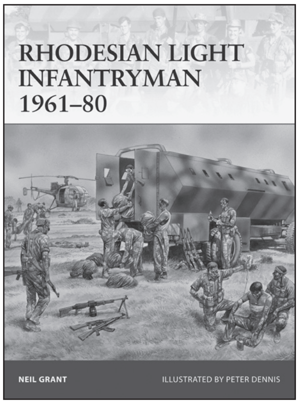

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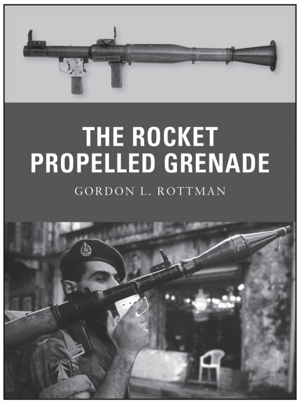

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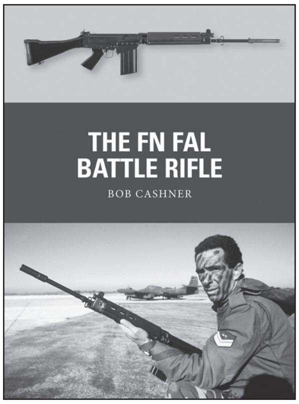

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